RESPONSE TO ALLEGED NOVs & IRLs

ATTACHMENT 14

Copies of MSDS of Solvents Used in Manufacturing

Elan Chemical Company, Inc.
Newark, NJ

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name	:	**Heptane**
Uses	:	Industrial Solvent.
Product Code	:	Q1352
Company	:	**Shell Chemical LP** PO Box 2463 HOUSTON TX 77252-2463 USA
MSDS Request	:	1-800-240-6737
Customer Service	:	1-866-897-4355

Emergency Telephone Number

Chemtrec Domestic (24 hr)	:	1-800-424-9300
Chemtrec International (24 hr)	:	1-703-527-3887

Other Information	:	PR.nr., 36485

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Concentration
Solvent Naphtha (Petroleum), Light Aliphatic	64742-89-8	100.00 %

Contains n-Heptane, CAS # 142-82-5

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance and Odour	:	Colourless. Liquid. Paraffinic.
Health Hazards	:	Vapours may cause drowsiness and dizziness. Irritating to skin. Harmful: may cause lung damage if swallowed.
Safety Hazards	:	Extremely flammable. Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger.
Environmental Hazards	:	Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Health Hazards

Inhalation	:	Vapours expected to be slightly irritating. Vapours may cause drowsiness and dizziness.
Skin Contact	:	Irritating to skin. Repeated exposure may cause skin dryness or cracking.
Eye Contact	:	Vapours may be irritating to the eye.
Ingestion	:	Harmful: may cause lung damage if swallowed.
Other Information	:	Possibility of organ or organ system damage from prolonged

exposure; see Chapter 11 for details. Target organ(s): Cardiovascular system. Central nervous system (CNS).

Signs and Symptoms : Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing. Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death. Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters. If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever.

Aggravated Medical Condition : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin.

Environmental Hazards : Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

General Information : In general no treatment is necessary, however, obtain medical advice.

Inhalation : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

Skin Contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.

Eye Contact : Flush eyes with water while holding eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision, or swelling persist, transport to the nearest medical facility for additional treatment.

Ingestion : If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Advice to Physician : Causes central nervous system depression. Dermatitis may result from prolonged or repeated exposure. Potential for chemical pneumonitis. Consider: gastric lavage with protected airway, administration of activated charcoal.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point : < -7 °C / 19 °F

Explosion / Flammability limits in air : 1 - 7 %(V)

Auto ignition temperature : 246 - 260 °C / 475 - 500 °F (ASTM E-659)

Specific Hazards : Carbon monoxide may be evolved if incomplete combustion occurs. Will float and can be reignited on surface water. The vapour is heavier than air, spreads along the ground and

distant ignition is possible.

Extinguishing Media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. Do not discharge extinguishing waters into the aquatic environment.
Unsuitable Extinguishing Media	:	Do not use water in a jet.
Protective Equipment for Firefighters	:	Wear full protective clothing and self-contained breathing apparatus.
Additional Advice	:	Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local and international regulations.

Protective measures	:	Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Material Safety Data Sheet. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.
Clean Up Methods	:	For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
Additional Advice	:	See Chapter 13 for information on disposal. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Vapour may form an explosive mixture with air. U.S. regulations may require reporting releases of this material to the environment which exceed the reportable quantity (refer to Chapter 15) to the National Response Centre at (800) 424-8802. Under Section 311 of the Clean Water Act (CWA) this material is considered an oil. As such, spills into surface waters must be reported to the National Response Centre at (800) 424-8802. This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore,

releases to the environment may not be reportable under CERCLA.

7. HANDLING AND STORAGE

General Precautions : Avoid breathing of or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

Handling : Avoid contact with skin, eyes, and clothing. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<= 1 m/sec until fill pipe submerged to twice its diameter, then <= 7 m/sec). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Handle and open container with care in a well-ventilated area. Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded. Do not empty into drains. Avoid handling above its flashpoint otherwise the product will form flammable/explosive vapour-air mixtures

Storage : Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat. Storage Temperature: Ambient. Keep away from aerosols, flammables, oxidizing agents, corrosives and from other flammable products which are not harmful or toxic to man or to the environment.

Product Transfer : Keep containers closed when not in use. Do not use compressed air for filling, discharging or handling.

Recommended Materials : For containers, or container linings use mild steel, stainless steel. For container paints, use epoxy paint, zinc silicate paint.

Unsuitable Materials : Avoid prolonged contact with natural, butyl or nitrile rubbers.

Container Advice : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

In the absence of occupational exposure standards for this product, it is recommended that the following are adopted.

Material	Source	Type	ppm	mg/m3	Notation
n-Heptane	ACGIH	TWA	400 ppm		

	ACGIH	STEL	500 ppm		
	OSHA Z1	PEL	500 ppm	2,000 mg/m3	
	OSHA Z1A	TWA	400 ppm	1,600 mg/m3	
	OSHA Z1A	STEL	500 ppm	2,000 mg/m3	
Stoddard Solvent	ACGIH	TWA	100 ppm		
	OSHA Z1	PEL	500 ppm	2,900 mg/m3	
	OSHA Z1A	TWA	100 ppm	525 mg/m3	

Additional Information : Shell has adopted as Interim Standards, the OSHA PELs that were established in 1989 and later rescinded.
Wash hands before eating, drinking, smoking and using the toilet.

Exposure Controls : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits. Eye washes and showers for emergency use.

Personal Protective Equipment : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory Protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for organic gases and vapours [boiling point >65 °C (149 °F)] meeting EN141. Where air-filtering respirators are unsuitable (e.g., airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.

Hand Protection : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection:
Longer term protection: Nitrile rubber gloves Incidental contact/Splash protection: PVC or neoprene rubber gloves

Eye Protection : Chemical splash goggles (chemical monogoggles).

Protective Clothing : Use protective clothing which is chemical resistant to this material. Safety shoes and boots should also be chemical resistant.

Monitoring Methods : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha-slc.gov/dts/sltc/methods/toc.html Health and

		Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hsl.gov.uk/search.htm Examples of sources of recommended air monitoring methods are given below or contact supplier. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of analytical Methods http://www.cdc.gov/niosh/nmam/nmammenu.html
Environmental Exposure Controls	:	Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Colourless. Liquid.
Odour	:	Paraffinic.
Boiling point	:	90 - 100 °C / 194 - 212 °F
Flash point	:	< -7 °C / 19 °F
Explosion / Flammability limits in air	:	1 - 7 %(V)
Auto-ignition temperature	:	246 - 260 °C / 475 - 500 °F (ASTM E-659)
Vapour pressure	:	6 - 7.7 kPa at 20 °C / 68 °F
Specific gravity	:	0.7 - 0.71 at 20 °C / 68 °F
Density	:	Typical 713 kg/m3 at 15 °C / 59 °F (ASTM D-4052)
Water solubility	:	2.6 mg/l at 25 °C / 77 °F Immiscible.

10. STABILITY AND REACTIVITY

Stability	:	Stable under normal conditions of use.
Conditions to Avoid	:	Avoid heat, sparks, open flames and other ignition sources.
Materials to Avoid	:	Strong oxidising agents.
Hazardous Decomposition Products	:	Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	:	Information given is based on product testing, and/or similar products, and/or components.
Acute Oral Toxicity	:	Expected to be of low toxicity: LD50 >2000 mg/kg , Rat Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.
Acute Dermal Toxicity	:	Expected to be of low toxicity: LD50 >2000 mg/kg , Rat
Acute Inhalation Toxicity	:	Expected to be of low toxicity: LC50>5000 ppm / 1 hours, Rat High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Skin Irritation	:	Irritating to skin.
Eye Irritation	:	Expected to be non-irritating to eyes.
Sensitisation	:	Not expected to be a skin sensitiser.

Repeated Dose Toxicity : Cardiovascular system: chronic abuse of similar materials has been associated with irregular heart rhythms and cardiac arrest.
Central nervous system: repeated exposure affects the nervous system. Kidney: caused kidney effects in male rats which are not considered relevant to humans

12. ECOLOGICAL INFORMATION

Acute Toxicity

Fish	:	Expected to be toxic: 1 < LC/EC/IC50 <= 10 mg/l
Aquatic Invertebrates	:	Expected to be toxic: 1 < LC/EC/IC50 <= 10 mg/l
Algae	:	Expected to be toxic: 1 < LC/EC/IC50 <= 10 mg/l
Microorganisms	:	Expected to be toxic: 1 < LC/EC/IC50 <= 10 mg/l
Mobility	:	Floats on water. Adsorbs to soil and has low mobility.
Persistence/degradability	:	Readily biodegradable. Oxidises rapidly by photo-chemical reactions in air.
Bioaccumulation	:	Has the potential to bioaccumulate.
Other Adverse Effects	:	

13. DISPOSAL CONSIDERATIONS

Material Disposal	:	Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Container Disposal	:	Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums. Send to drum recoverer or metal reclaimer.
Local Legislation	:	Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

14. TRANSPORT INFORMATION

US Department of Transportation Classification (49CFR)

Identification number	UN 1206
Proper shipping name	Heptanes
Class / Division	3
Packing group	II
Contains OIL	
Emergency Response Guide No .	128
Additional Information	This material is an 'OIL' under 49 CFR Part 130 when transported in a container of 3500 gallon capacity or greater.

IMDG

Identification number	UN 1206
Proper shipping name	HEPTANES
Class / Division	3
Packing group	II
Marine pollutant:	No

IATA (Country variations may apply)

Identification number	UN 1206
Proper shipping name	Heptanes
Class / Division	3
Packing group	II

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Federal Regulatory Status

Notification Status

AICS	Listed.	
DSL	Listed.	
INV (CN)	Listed.	
TSCA	Listed.	
EINECS	Listed.	265-192-2
KECI (KR)	Listed.	KE-31661
PICCS (PH)	Listed.	

Comprehensive Environmental Release, Compensation & Liability Act (CERCLA)

Heptane (64742-49-0)	Reportable quantity: 12,821 lbs
Cyclohexane (110-82-7)	Reportable quantity: 1,000 lbs
n-Hexane (110-54-3)	Reportable quantity: 5,000 lbs
Toluene (108-88-3)	Reportable quantity: 1,000 lbs

Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA. The components with RQs are given for information.

Clean Water Act (CWA) Section 311

Cyclohexane (110-82-7)	Reportable quantity: 1,000 lbs
Toluene (108-88-3)	Reportable quantity: 1,000 lbs

Under Section 311 of the Clean Water Act (CWA) this material is considered an oil. As such, spills into surface waters must be reported to the National Response Centre at (800) 424-8802. The components with RQs are given for information.

SARA Hazard Categories (311/312)

Immediate (Acute) Health Hazard. Fire Hazard.

SARA Toxic Release Inventory (TRI) (313)

Cyclohexane (110-82-7)	7.80%
n-Hexane (110-54-3)	0.50%
Toluene (108-88-3)	0.005%

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

Known to the State of California to cause birth defects or other reproductive harm.

Toluene (108-88-3) 0.005%	Developmental toxin.

New Jersey Right-To-Know Chemical List

n-Heptane (142-82-5) 40.00%	Listed.
Cyclohexane (110-82-7) 7.80%	
n-Hexane (110-54-3) 0.50%	
Octane (111-65-9) 0.10%	Listed.
Toluene (108-88-3) 0.005%	

Pennsylvannia Right-To-Know Chemical List

n-Heptane (142-82-5) 40.00%	Listed.
Cyclohexane (110-82-7) 7.80%	Environmental hazard.
	Listed.
n-Hexane (110-54-3) 0.50%	Listed.
Octane (111-65-9) 0.10%	Listed.
Toluene (108-88-3) 0.005%	Environmental hazard.
	Listed.

16. OTHER INFORMATION

HMIS Rating (Health, Fire, Reactivity)	:	1, 3, 0
NFPA Rating (Health, Fire, Reactivity)	:	1, 3, 0
MSDS Version Number	:	11.5
MSDS Effective Date	:	11/29/2005
MSDS Revisions	:	A vertical bar (|) in the left margin indicates an amendment from the previous version.

MSDS Regulation	:	The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
Uses and Restrictions	:	Industrial Solvent.
MSDS Distribution	:	The information in this document should be made available to all who may handle the product
Disclaimer	:	The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
(425) 889-3400

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

The Version Date and Number for this MSDS is : 08/05/2004 - #006

PRODUCT NAME:	ACETONE
MSDS NUMBER:	MZA0446
DATE ISSUED:	8/4/2004
SUPERSEDES:	3/2/2004
ISSUED BY:	008614

ACETONE

1. PRODUCT IDENTIFICATION

SYNONYMS: DIMETHYLKETONE; 2-PROPANONE; DIMETHYLKETAL
CAS NO: 67-64-1
MOLECULAR WEIGHT: 58.08
CHEMICAL FORMULA: (CH3)2CO

Distributed by:
Univar USA Inc.
6100 Carillon Point
Kirkland, WA 98033
425-889-3400

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO	PERCENT	HAZARDOUS
ACETONE	67-64-1	99 - 100%	YES

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Post-it® Fax Note 7671 | Date 7/11 | # of pages ▶ 7
To MARY | From Cynthia
Co./Dept. | Co. UNIVAR

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

POTENTIAL HEALTH EFFECTS

INHALATION:
INHALATION OF VAPORS IRRITATES THE RESPIRATORY TRACT. MAY CAUSE COUGHING, DIZZINESS, DULLNESS, AND HEADACHE. HIGHER CONCENTRATIONS CAN PRODUCE CENTRAL NERVOUS SYSTEM DEPRESSION, NARCOSIS, AND UNCONSCIOUSNESS.

INGESTION:
SWALLOWING SMALL AMOUNTS IS NOT LIKELY TO PRODUCE HARMFUL EFFECTS. INGESTION OF LARGER AMOUNTS MAY PRODUCE ABDOMINAL PAIN, NAUSEA AND VOMITING. ASPIRATION INTO LUNGS CAN PRODUCE SEVERE LUNG DAMAGE AND IS A MEDICAL EMERGENCY. OTHER SYMPTOMS ARE EXPECTED TO PARALLEL INHALATION.

SKIN CONTACT:
IRRITATING DUE TO DEFATTING ACTION ON SKIN. CAUSES REDNESS, PAIN, DRYING AND CRACKING OF THE SKIN.

EYE CONTACT:
VAPORS ARE IRRITATING TO THE EYES. SPLASHES MAY CAUSE SEVERE IRRITATION, WITH STINGING, TEARING, REDNESS AND PAIN.

CHRONIC EXPOSURE:
PROLONGED OR REPEATED SKIN CONTACT MAY PRODUCE SEVERE IRRITATION OR DERMATITIS.

AGGRAVATION OF PRE-EXISTING CONDITIONS:
USE OF ALCOHOLIC BEVERAGES ENHANCES TOXIC EFFECTS. EXPOSURE MAY INCREASE THE TOXIC POTENTIAL OF CHLORINATED HYDROCARBONS, SUCH AS CHLOROFORM, TRICHLOROETHANE.

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4. FIRST AID MEASURES

INHALATION:
REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.

INGESTION:
ASPIRATION HAZARD. IF SWALLOWED, VOMITING MAY OCCUR SPONTANEOUSLY, BUT DO NOT INDUCE. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION INTO LUNGS. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL A PHYSICIAN IMMEDIATELY.

SKIN CONTACT:
IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. GET MEDICAL ATTENTION. WASH CLOTHING BEFORE REUSE. THOROUGHLY CLEAN SHOES BEFORE REUSE.

EYE CONTACT:
IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION.

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5. FIRE FIGHTING MEASURES

FIRE:
FLASH POINT: -20C (-4F) CC
AUTOIGNITION TEMPERATURE: 465C (869F)
FLAMMABLE LIMITS IN AIR % BY VOLUME:
LEL: 2.5; UEL: 12.8
EXTREMELY FLAMMABLE LIQUID AND VAPOR! VAPOR MAY CAUSE FLASH FIRE.

EXPLOSION:
ABOVE FLASH POINT, VAPOR-AIR MIXTURES ARE EXPLOSIVE WITHIN FLAMMABLE LIMITS NOTED ABOVE. VAPORS CAN FLOW ALONG SURFACES TO DISTANT IGNITION SOURCE AND FLASH BACK. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE. SEALED CONTAINERS MAY RUPTURE WHEN HEATED. THIS MATERIAL MAY PRODUCE A FLOATING FIRE HAZARD. SENSITIVE TO STATIC DISCHARGE.

FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL, ALCOHOL FOAM OR CARBON DIOXIDE. WATER MAY BE INEFFECTIVE. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL, DILUTE SPILLS TO NONFLAMMABLE MIXTURES, PROTECT PERSONNEL ATTEMPTING TO STOP LEAK AND DISPERSE VAPORS.

SPECIAL INFORMATION:
IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

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6. ACCIDENTAL RELEASE MEASURES

VENTILATE AREA OF LEAK OR SPILL. REMOVE ALL SOURCES OF IGNITION. WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT AS SPECIFIED IN SECTION 8. ISOLATE HAZARD AREA. KEEP UNNECESSARY AND UNPROTECTED PERSONNEL FROM ENTERING. CONTAIN AND RECOVER LIQUID WHEN POSSIBLE. USE NON-SPARKING TOOLS AND EQUIPMENT. COLLECT LIQUID IN AN APPROPRIATE CONTAINER OR ABSORB WITH AN INERT MATERIAL (E. G., VERMICULITE, DRY SAND, EARTH), AND PLACE IN A CHEMICAL WASTE CONTAINER. DO NOT USE COMBUSTIBLE MATERIALS, SUCH AS SAW DUST. DO NOT FLUSH TO SEWER! IF A LEAK OR SPILL HAS NOT IGNITED, USE WATER SPRAY TO DISPERSE THE VAPORS, TO PROTECT PERSONNEL ATTEMPTING TO STOP LEAK, AND TO FLUSH SPILLS AWAY FROM EXPOSURES. US REGULATIONS (CERCLA) REQUIRE REPORTING SPILLS AND RELEASES TO SOIL, WATER AND AIR IN EXCESS OF REPORTABLE QUANTITIES. THE TOLL FREE NUMBER FOR THE US COAST GUARD NATIONAL RESPONSE CENTER IS (800) 424-8802.

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7. HANDLING AND STORAGE

PROTECT AGAINST PHYSICAL DAMAGE. STORE IN A COOL, DRY WELL-VENTILATED LOCATION, AWAY FROM ANY AREA WHERE THE FIRE HAZARD MAY BE ACUTE. OUTSIDE OR DETACHED STORAGE IS PREFERRED. SEPARATE FROM INCOMPATIBLES. CONTAINERS SHOULD BE BONDED AND GROUNDED FOR TRANSFERS TO AVOID STATIC SPARKS. STORAGE AND USE AREAS SHOULD BE NO SMOKING AREAS. USE NON-SPARKING TYPE TOOLS AND EQUIPMENT, INCLUDING EXPLOSION PROOF VENTILATION. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTY SINCE THEY RETAIN PRODUCT RESIDUES (VAPORS, LIQUID); OBSERVE ALL WARNINGS AND PRECAUTIONS LISTED FOR THE PRODUCT.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

AIRBORNE EXPOSURE LIMITS:
ACETONE:
-OSHA PERMISSIBLE EXPOSURE LIMIT (PEL):
1000 PPM (TWA)

-ACGIH THRESHOLD LIMIT VALUE (TLV):
500 PPM (TWA), 750 PPM (STEL) A4 - NOT CLASSIFIABLE AS A HUMAN CARCINOGEN

VENTILATION SYSTEM:
A SYSTEM OF LOCAL AND/OR GENERAL EXHAUST IS RECOMMENDED TO KEEP EMPLOYEE EXPOSURES BELOW THE AIRBORNE EXPOSURE LIMITS. LOCAL EXHAUST VENTILATION IS GENERALLY PREFERRED BECAUSE IT CAN CONTROL THE EMISSIONS OF THE CONTAMINANT AT ITS SOURCE, PREVENTING DISPERSION OF IT INTO THE GENERAL WORK AREA. PLEASE REFER TO THE ACGIH DOCUMENT, "INDUSTRIAL VENTILATION, A MANUAL OF RECOMMENDED PRACTICES", MOST RECENT EDITION, FOR DETAILS.

PERSONAL RESPIRATORS (NIOSH APPROVED):
IF THE EXPOSURE LIMIT IS EXCEEDED AND ENGINEERING CONTROLS ARE NOT FEASIBLE, A HALF-FACE ORGANIC VAPOR RESPIRATOR MAY BE WORN FOR UP TO TEN TIMES THE EXPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST. A FULL-FACE PIECE ORGANIC VAPOR RESPIRATOR MAY BE WORN UP TO 50 TIMES THE EXPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST. FOR EMERGENCIES OR INSTANCES WHERE THE EXPOSURE LEVELS ARE NOT KNOWN, USE A FULL-FACE PIECE POSITIVE-PRESSURE, AIR-SUPPLIED RESPIRATOR. WARNING: AIR-PURIFYING RESPIRATORS DO NOT PROTECT WORKERS IN OXYGEN-DEFICIENT ATMOSPHERES.

SKIN PROTECTION:
WEAR IMPERVIOUS PROTECTIVE CLOTHING, INCLUDING BOOTS, GLOVES, LAB COAT, APRON OR COVERALLS, AS APPROPRIATE, TO PREVENT SKIN CONTACT.

EYE PROTECTION:
USE CHEMICAL SAFETY GOGGLES AND/OR A FULL FACE SHIELD WHERE SPLASHING IS POSSIBLE. MAINTAIN EYE WASH FOUNTAIN AND QUICK-DRENCH FACILITIES IN WORK AREA.

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9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:
CLEAR, COLORLESS, VOLATILE LIQUID.

ODOR:
FRAGRANT, MINT-LIKE

SOLUBILITY:
MISCIBLE IN ALL PROPORTIONS IN WATER.

SPECIFIC GRAVITY:
0.79 @ 20C/4C

PH:
NO INFORMATION FOUND.

BOILING POINT:
56.5C (133F) @ 760 MM HG

MELTING POINT:
-95C (-139F)

VAPOR DENSITY (AIR=1):
2.0

VAPOR PRESSURE (MM HG):
400 @ 39.5C (104F)

EVAPORATION RATE (BUAC=1):
CA. 7.7

% VOLATILES BY VOLUME @ 21C (70F):
100

==========

10. STABILITY AND REACTIVITY

STABILITY:
STABLE UNDER ORDINARY CONDITIONS OF USE AND STORAGE.

HAZARDOUS DECOMPOSITION PRODUCTS:
CARBON DIOXIDE AND CARBON MONOXIDE MAY FORM WHEN HEATED TO DECOMPOSITION.

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR.

INCOMPATIBILITIES:
CONCENTRATED NITRIC AND SULFURIC ACID MIXTURES, OXIDIZING MATERIALS, CHLOROFORM, ALKALIS, CHLORINE COMPOUNDS, ACIDS, POTASSIUM T-BUTOXIDE.

CONDITIONS TO AVOID:
HEAT, FLAMES, IGNITION SOURCES AND INCOMPATIBLES.

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11. TOXICOLOGICAL INFORMATION

ORAL RAT LD50: 5800 MG/KG; INHALATION RAT LC50: 50,100MG/M3; IRRITATION EYE RABBIT, STANDARD DRAIZE, 20 MG SEVERE; INVESTIGATED AS A TUMORIGEN, MUTAGEN, REPRODUCTIVE EFFECTOR.

--------/CANCER LISTS/----------

INGREDIENT	---NTP CARCINOGEN--- KNOWN	ANTICIPATED	IARC CATEGOR
ACETONE (67-64-1)	NO	NO	NONE

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO READILY BIODEGRADE. WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO LEACH INTO GROUNDWATER. WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO QUICKLY EVAPORATE. WHEN RELEASED INTO WATER, THIS MATERIAL IS EXPECTED TO READILY BIODEGRADE. WHEN RELEASED TO WATER, THIS MATERIAL IS EXPECTED TO QUICKLY EVAPORATE. THIS MATERIAL HAS A LOG OCTANOL-WATER PARTITION COEFFICIENT OF LESS THAN 3.0. THIS MATERIAL IS NOT EXPECTED TO SIGNIFICANTLY BIOACCUMULATE. WHEN RELEASED INTO THE AIR, THIS MATERIAL MAY BE MODERATELY DEGRADED BY REACTION WITH PHOTOCHEMICALLY PRODUCED HYDROXYL RADICALS. WHEN RELEASED INTO THE AIR, THIS MATERIAL MAY BE MODERATELY DEGRADED BY PHOTOLYSIS. WHEN RELEASED INTO THE AIR, THIS MATERIAL IS EXPECTED TO BE READILY REMOVED FROM THE ATMOSPHERE BY WET DEPOSITION.

ENVIRONMENTAL TOXICITY:
THIS MATERIAL IS NOT EXPECTED TO BE TOXIC TO AQUATIC LIFE. THE LC50/96-HOUR VALUES FOR FISH ARE OVER 100 MG/L.

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13. DISPOSAL CONSIDERATIONS

WHATEVER CANNOT BE SAVED FOR RECOVERY OR RECYCLING SHOULD BE HANDLED AS HAZARDOUS WASTE AND SENT TO A RCRA APPROVED INCINERATOR OR DISPOSED IN A RCRA APPROVED WASTE FACILITY. PROCESSING, USE OR CONTAMINATION OF THIS PRODUCT MAY CHANGE THE WASTE MANAGEMENT OPTIONS. STATE AND LOCAL DISPOSAL REGULATIONS MAY DIFFER FROM FEDERAL DISPOSAL REGULATIONS.

DISPOSE OF CONTAINER AND UNUSED CONTENTS IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REQUIREMENTS.

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14. TRANSPORT INFORMATION

DOMESTIC (LAND, D.O.T.)

PROPER SHIPPING NAME: ACETONE
HAZARD CLASS: 3
UN/NA: UN1090 PACKING GROUP: II

INTERNATIONAL (WATER, I.M.O.)

PROPER SHIPPING NAME: ACETONE
HAZARD CLASS: 3
UN/NA: UN1090 PACKING GROUP: II

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15. REGULATORY INFORMATION

--------/CHEMICAL INVENTORY STATUS - PART 1/----------

INGREDIENT	TSCA	EC	JAPAN	AUSTRALIA
ACETONE (67-64-1)	YES	YES	YES	YES

--------/CHEMICAL INVENTORY STATUS - PART 2/----------

INGREDIENT	KOREA	--CANADA-- DSL	NDSL	PHIL.
ACETONE (67-64-1)	YES	YES	NO	YES

-------/FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 1/----------

INGREDIENT	-SARA 302- RQ	TPQ	------SARA 313----- LIST	CHEMICAL CATG
ACETONE (67-64-1)	NO	NO	YES	NO

--------/FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 2/----------

INGREDIENT	-RCRA- -TSCA- CERCLA	261.33	8(D)
ACETONE (67-64-1)	5000	U002	NO

CHEMICAL WEAPONS CONVENTION: NO TSCA 12(B): YES CDTA: YES
SARA 311/312: ACUTE: YES CHRONIC: NO FIRE: YES PRESSURE: NO
REACTIVITY: NO (PURE / LIQUID)

AUSTRALIAN HAZCHEM CODE: 2(Y)E
POISON SCHEDULE: NONE ALLOCATED.

WHMIS: THIS MSDS HAS BEEN PREPARED ACCORDING TO THE HAZARD CRITERIA OF THE CONTROLLED PRODUCTS REGULATIONS (CPR) AND THE MSDS CONTAINS ALL OF THE INFORMATION REQUIRED BY THE CPR.

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16. OTHER INFORMATION

NFPA RATINGS:
HEALTH: 1 FLAMMABILITY: 3 REACTIVITY: 0

For Additional Information:
Contact: MSDS Coordinator - Univar USA
During business hours, Pacific Time - (425) 889-3400

NOTICE
Univar USA expressly disclaims all express or implied warranties of merchantibility and fitness for a particular purpose with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar USA Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar USA makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar USA's control. Therefore, users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes, and they assume all risks of their use, handling, and disposal of the product or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein and does not relate to its use in combination with any other material or in any other process.

END OF MSDS

Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
(425) 889-3400

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

The Version Date and Number for this MSDS is : 08/03/2004 - #001

****
PRODUCT IDENTIFICATION
****

PRODUCT NAME: METHANOL

MSDS#: EZ64835

DATE ISSUED: 09/30/2003

SUPERSEDES: NEW

ISSUED BY: 009292

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name Methanol

Distributed by:
Univar USA Inc.
6100 Carillon Point
Kirkland, WA 98033
425-889-3400

Chemical Name	methanol
Synonym(s)	982893
Molecular Formula	CH4O
Molecular Weight	32.04
Product Use	solvent
OSHA Status	hazardous

For emergency transportation information, call CHEMTREC at 800-424-9300

2. COMPOSITION INFORMATION ON INGREDIENTS

(Typical composition is given, and it may vary. A certificate of analysis can be provided, if available.)

Weight % Component CAS Registry Nc

Post-it® Fax Note 7671	Date 7/11	# of pages ▶ 7
To MARY	From Cynthia	
Co./Dept.	Co. UNIVAR	

100% methanol 67-56-1

3. HAZARDS IDENTIFICATION

DANGER!
FLAMMABLE LIQUID AND VAPOR
MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED
CANNOT BE MADE NONPOISONOUS - VAPOR HARMFUL
HARMFUL IF ABSORBED THROUGH SKIN

HMIS(R) Hazard Ratings: Health - 2*, Flammability -3, Chemical Reactivity - 0

HMIS(R) rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

4. FIRST-AID MEASURES

Inhalation:
Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician or poison control center immediately.

Eyes:
Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.

Skin:
Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Ingestion:
Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person.

Note to Physicians: Symptoms of poisoning may not appear for several hours. Keep under medical supervision for at least 48 hours.

5. FIRE FIGHTING MEASURES

Extinguishing Media:
Water spray, dry chemical, carbon dioxide, alcohol foam

Special Fire-Fighting Procedures:
Wear self-contained breathing apparatus and protective clothing.
Use water spray to keep fire-exposed containers cool. Water may be ineffective in fighting the fire.

Hazardous Combustion Products:
Carbon dioxide, carbon monoxide

Unusual Fire and Explosion Hazards:
Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Prevent buildup of vapors or gases to explosive concentrations.

Sensitivity to Static Discharge:
Material is unlikely to accumulate a static charge which could act as an ignition source.

6. ACCIDENTAL RELEASE MEASURES

Wear appropriate personal protective equipment. Eliminate all ignition sources. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste.

For Large Spills:
Use water spray to disperse vapors and dilute spill to a nonflammable mixture.

Prevent runoff from entering drains, sewers, or streams.

7. HANDLING AND STORAGE

Personal Precautionary Measures:
Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion:
Keep away from heat, sparks, and flame. Keep from contact with oxidizing materials. Use only with adequate ventilation. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

Storage:
Keep container tightly closed and in a well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Country specific exposure limits have not been established or are not applicable unless listed below.

METHANOL
US. ACGIH Threshold Limit Values
Time Weighted Average (TWA): 200 ppm,
US. ACGIH Threshold Limit Values
Short Term Exposure Limit (STEL): 250 ppm,
US. ACGIH Threshold Limit Values
Skin designation: Can be absorbed through the skin.
METHYL ALCOHOL
US. NIOSH: Pocket Guide to Chemical Hazards
Recommended exposure limit (REL): 200 ppm, 260 mg/m3
US. NIOSH: Pocket Guide to Chemical Hazards
Short Term Exposure Limit (STEL): 250 ppm, 325 mg/m3
US. NIOSH: Pocket Guide to Chemical Hazards
Skin designation: Can be absorbed through the skin.
METHYL ALCOHOL; METHANOL
US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants
Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 200 ppm, 260 mg/m3
US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants
Ceiling Limit Value: 1,000 ppm,

US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants
Short Term Exposure Limit (STEL): 250 ppm, 325 mg/m3
US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants
Skin designation: Can be absorbed through the skin.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
PEL: 200 ppm, 260 mg/m3

Ventilation:
Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Respiratory Protection:
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: full-face positive-pressure air-supplied

Eye Protection:
Wear safety glasses with side shields (or goggles). Wear a full-face respirator, if needed.

Skin Protection:
Wear chemical-resistant gloves, footwear, and protective clothing appropriate for the risk of exposure. Contact health and safety professional or manufacturer for specific information.

Recommended Decontamination Facilities:
Eye bath, washing facilities, safety shower

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Liquid
Color:	Colorless
Odor:	Sweet, alcohol
Odor Threshold:	100 ppm
Specific Gravity:	0.79 (20 C)
Vapor Pressure:	21 C; 133 mbar
Vapor Density:	1.1
Freezing Point:	-98 C
Boiling Point:	65 C
Evaporation Rate:	2.6 (n-butyl acetate = 1 Evaporation Rate: 0.2 (diethyl ether = 1)
Viscosity:	0.58 mPa.s (20 C) ,
Solubility in Water:	Complete
pH:	Not applicable

Octanol/Water Partition Coefficient: P: 0.17; log P: -0.77
Flash Point: 10 C (Tag closed cup)
Lower Flammable Limit: 6.61 %(V)
Upper Flammable Limit: 36.5 %(V)
Autoignition Temperature: 446 C (ASTM D2155)

Thermal Decomposition Temperature: (DTA) No exotherm to boiling

10.STABILITY AND REACTIVITY

Stability:
Stable.

Incompatibility:
Material reacts with strong acids, strong bases. Material reacts violently with strong oxidizing agents

Hazardous Polymerization:
Will not occur.

11. TOXICOLOGICAL INFORMATION

General:
Prolonged and repeated exposure to high vapor concentrations, skin absorption or ingestion of methanol may result in visual disturbances, metabolic acidosis, headache, giddiness, nausea, insomnia, gastric disturbance, dizziness, and slow breathing. There have been severe cases reported of blindness, coma and death due to the ingestion of methanol. Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

Oral LD-50:(rat)	6.2 g/kg
Inhalation LC-50: (rat)	8 h: > 22500 ppm
Dermal LD-50: (rabbit)	15.8 g/kg
Skin Irritation (guinea pig)	moderate
Eye Irritation (rabbit)	slight

12. ECOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

Oxygen Demand Data:

BOD-5: 0.76 - 1.12 g/g
BOD-20: 1.26 g/g
COD: 1.05 - 1.5 g/g

Acute Aquatic Effects Data:
96 h LC-50 (fathead minnow): > 10000 microliter(s)/l NOEC: 10000 microliter(s)A
96 h LC-50 (sideswimmer): > 100 microliter(s)/l NOEC: 100 microliter(s)/l
24 h EC-50 (daphnid): > 10000 mg/I
96 h LC-50 (daphnid): > 1000 microliter(s)/l NOEC: 100 microliter(s)/l
96 h LC-50 (ramshorn snail): > 100 microliter(s)A NOEC: 100 microliter(s)/l
96 h LC-50 (aquatic earthworm): > 100 microliter(s)A NOEC: 100 microliter(s)A
96 h LC-50 (pill bug): > 100 microliter(s)A NOEC: 100 microliter(s)/l
96 h LC-50 (flatworm): > 100 microliter(s)/I NOEC: 100 microliter(s)/l

13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Mix with compatible chemical which is less flammable and incinerate. Since emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near this container.

14. TRANSPORT INFORMATION

Marine pollutant components: None unless listed below

Reportable Quantity: 2,270 kg
DOT (USA): Class 3 Packing group II
ICAO Status: Class 3 Packing group II
Subsidiary Risk Class 6.1
IMDG Status: Class 3 Packing group II
Subsidiary Risk Class 6.1

15. REGULATORY INFORMATION

WHMIS (Canada) Status: controlled
WHMIS (Canada) Hazard Classification: B/2, D/1/B

SARA 311-312 Hazard Classification(s):
immediate (acute) health hazard
delayed (chronic) health hazard
fire hazard

SARA 313: None, unless listed below

METHANOL
Carcinogenicity Classification (components present at 0.1% or more):
none, unless listed below

TSCA (US Toxic Substances Control Act): This product is listed on the TSCA inventory. Any impurities present in this product are exempt from listing.

DSL (Canadian Domestic Substances List) and CEPA (Canadian Environmental Protection Act): This product is listed on the DSL or otherwise complies with CEPA new substance notification requirements.

EINECS (European Inventory of Existing Commercial Chemical Substances):
This product is listed on EINECS.
EINECS Number: 200-659-6
AICS / NICNAS (Australian Inventory of Chemical Substances and National Industrial Chemicals Notification and Assessment Scheme): This product is listed on AICS or otherwise complies with NICNAS.

MITI (Japanese Handbook of Existing and New Chemical Substances): This product is listed in the Handbook or has been approved in Japan by new substance notification.

ECL (Korean Toxic Substances Control Act): This product is listed on the Korean inventory or otherwise complies with the Korean Toxic Substances Control Act.

16. OTHER INFORMATION

For Additional Information:
Contact: MSDS Coordinator - Univar USA
During business hours, Pacific Time - (425) 889-3400

NOTICE

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END OF MSDS

Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
(425) 889-3400

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

The Version Date and Number for this MSDS is : 05/30/2006 - #007

****
PRODUCT IDENTIFICATION
****

PRODUCT NAME: ISOPAR C SOLVENT

MSDS NUMBER: EX834642

DATE ISSUED: 2/27/2003

SUPERCEDES: 2/20/2002

ISSUED BY: 008505

This MSDS was reviewed on 5/30/2006, and is current as of the DATE ISSUED above.

MATERIAL SAFETY DATA SHEET

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ISOPAR C FLUID
CHEMICAL NAME:
Synthetic Isoparaffinic Hydrocarbon CAS 64741-66-8
CHEMICAL FAMILY:
Aliphatic Hydrocarbon
PRODUCT DESCRIPTION:
Clear colorless liquid.

CONTACT ADDRESS:
ExxonMobil Chemical Company
P.O. Box 3272, Houston, Texas 77253-3272

** EMERGENCY TELEPHONE NUMBERS: (24 Hours) **
** CHEMTREC (800) 424-9300 **
** ExxonMobil Chemical Company (800) 726-2015 **

NON EMERGENCY TELEPHONE NUMBERS : (Sam-5pm M-F)
FOR GENERAL PRODUCT INFORMATION CALL : (281) 870-6000
FOR HEALTH AND MEDICAL INFORMATION CALL : (281) 870-6884

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

This product is hazardous as defined in 29 CFR1910.1200.

OSHA HAZARD

Flammable

SECTION 3 HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

EYE CONTACT:

Slightly irritating but does not injure eye tissue.

SKIN CONTACT:

Frequent or prolonged contact may irritate and cause dermatitis.
Low order of toxicity.
Skin contact may aggravate an existing dermatitis condition.

INHALATION:

High vapor / aerosol concentrations (attainable at elevated temperatures well above ambient) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

INGESTION:

Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild to severe pulmonary injury, possibly progressing to death.
Minimal toxicity.

SECTION 4 FIRST AID MEASURES

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water; use soap if available.
Remove grossly contaminated clothing, including shoes, and launder before reuse.

INHALATION:

Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

SECTION 5 FIRE-FIGHTING MEASURES

FLASH POINT:	18 Deg F. METHOD: TCC ASTM D56	NOTE: Typical
FLAMMABLE LIMITS:	LEL: 0.9 UEL: 6.3 @ 77 Deg F.	NOTE: Approximate
AUTOIGNITION TEMPERATURE:	828 Deg F.	

GENERAL HAZARD

Extremely Flammable, material will readily ignite at ambient temperatures.
Static Discharge, material can accumulate static charges which can cause an incendiary electrical discharge .
"Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.
Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

FIRE FIGHTING

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off "fuel" to fire. If a leak or spill has not ignited, use water

spray to disperse the vapors.
Either allow fire to burn under controlled conditions or extinguish with foam or dry chemical. Try to cover liquid spills with foam.
Avoid spraying water directly into storage containers due to danger of boilover.
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
No unusual

SECTION 6 ACCIDENTAL RELEASE MEASURES
LAND SPILL
Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section 15 REGULATORY INFORMATION) notify the National Response Center.
Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof or hand pump) or with a suitable absorbent.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL
Eliminate sources of ignition. Warn occupants and shipping in surrounding and downwind areas of fire and explosion hazard and request all to stay clear.
Remove from surface with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

SECTION 7 STORAGE AND HANDLING
ELECTROSTATIC ACCUMULATION HAZARD:
Yes, use proper bonding and/or grounding procedure.
Additional information regarding safe handling of products with static accumulation potential can be ordered by contacting the American Petroleum Institute (API) for API Recommended Practice 2003, entitled "Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents" (American Petroleum Institute, 1220 L Street Northwest, Washington, DC 20005), or the National Fire Protection Association (NFPA) for NFPA 77 entitled "Static Electricity" (National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101).

STORAGE TEMPERATURE, deg F:
Ambient

LOADING/UNLOADING TEMPERATURE, deg F:
Ambient

STORAGE/TRANSPORT PRESSURE, mmHg:
Atmospheric

LOADING/UNLOADING VISCOSITY, cSt:
0.9

STORAGE AND HANDLING:
Keep container closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials.
Do NOT handle or store near an open flame, heat or other sources of ignition. Protect material from direct sunlight.
Material will accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures.
Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Do NOT reuse empty containers

without commercial cleaning or reconditioning.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE CONTROLS

The use of local exhaust ventilation is recommended to control process emissions near the source. Laboratory samples should be handled in a lab hood. Provide mechanical ventilation of confined spaces.
See respiratory protection recommendations.
Use explosion-proof ventilation equipment.

PERSONAL PROTECTION

For open systems where contact is likely, wear safety glasses with side shields, long sleeves, and chemical resistant gloves.
Where contact may occur, wear safety glasses with side shields.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.

WORKPLACE EXPOSURE GUIDELINES

ExxonMobil RECOMMENDS THE FOLLOWING OCCUPATIONAL EXPOSURE LIMITS:
a TWA of 1400 mg/m3 (300 ppm) based on total hydrocarbon.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

SPECIFIC GRAVITY, at deg F:
0.70 at 60

SOLUBILITY IN WATER, wt. % at deg F:
Less than 0.01 at 77

SP. GRAY. OF VAPOR, at 1 atm (Air=1):
3.90 Calculated

EVAPORATION RATE, n-Bu Acetate=1:
4.3

VAPOR PRESSURE, mmHg at deg F:
36.9 at 68 Estimate

VISCOSITY OF LIQUID, cSt at deg F:
0.7 at 77

FREEZING/MELTING POINT, deg F:
-71 (Pour Point)

BOILING POINT, deg F:
208 to 219

SECTION 10 STABILITY AND REACTIVITY

STABILITY:
Stable

CONDITIONS TO AVOID INSTABILITY:
Not applicable

HAZARDOUS POLYMERIZATION:
Will not occur

CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION:
Not applicable

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:
None

SECTION 11 TOXICOLOGICAL INFORMATION

Please refer to Section 3 for available information on potential health effects.

SECTION 12 ECOLOGICAL INFORMATION

No specific ecological data are available for this product. Please refer to Section 6 for information regarding accidental releases and Section 15 for regulatory reporting information.

SECTION 13 DISPOSAL CONSIDERATIONS

Please refer to Sections 5, 6, and 15 for disposal and regulatory information.

SECTION 14 TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT):
DOT SHIPPING DESCRIPTION: PETROLEUM DISTILLATE, N.O.S., 3, UN 1268, II

SECTION 15 REGULATORY INFORMATION

TSCA:

This product is listed on the TSCA Inventory at CAS Registry Number 64741-66-8

Clean Water Act/Oil Pollution Act:

This product is classified as an oil under Section 311 of the Clean Water Act (40 CFR 110) and the Oil Pollution Act of 1990. Discharge or spills which produce a visible sheen on either surface water, or in waterways/sewers which lead to surface water, must be reported to the National Response Center at 800-424-8802.

CERCLA:

This product, as sold, is derived from a fraction of crude oil and is excluded from the spill reporting requirements by CERCLA Section 101(14)(F). When this product is used in a mixture or as an ingredient in another product or in a manufacturing operation, the petroleum exclusion may terminate and an accidental spill may require reporting to the National Response Center at 800-424-8802.

This product contains approximately 80% of 2,2,4 Trimethylpentane. The reportable quantity of 2,2,4 Trimethylpentane is 1,000 pounds.

SARA TITLE III:

Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories: Fire.

This information may be subject to the provisions of the Community Right-to-Know Reporting Requirements (40 CFR 370) if threshold quantity criteria are met.

This product does not contain Section 313 Reportable Ingredients.

SECTION 16 OTHER INFORMATION

HAZARD RATING SYSTEMS:

This information is for people trained in:

National Paint & Coatings Association's (NPCA) Hazardous Materials Identification System (HMIS)

National Fire Protection Association (NFPA 704) Identification of the Fire Hazards of Materials

	NPCA-HMIS	NFPA 704	KEY
HEALTH	1	1	4 = Severe
FLAMMABILITY	3	3	3 = Serious
REACTIVITY	0	0	2 = Moderate
			1 = Slight
			0 = Minimal

CAUTION: HMIS ratings are based on a 0-4 rating scale with 1 representing minimal hazards or risks, and 4 representing significant hazards or risks. Recommended HMIS ratings should not be used in the absence of a fully implemented HMIS hazard communication program.

REVISION SUMMARY:

Since 2/20/2002 this MSDS has been revised in Section(s):

3

REFERENCE NUMBER: HDHA-C-25035

For Additional Information:

Contact: MSDS Coordinator - Univar USA
During business hours, Pacific Time - (425) 889-3400

NOTICE
Univar USA expressly disclaims all express or implied warranties of merchantibility and fitness for a particular purpose with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar USA Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar USA makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar USA's control. Therefore, users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes, and they assume all risks of their use, handling, and disposal of the product or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein and does not relate to its use in combination with any other material or in any other process.

END OF MSDS

MATERIAL SAFETY DATA SHEET

Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: 1) Notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; 2) Furnish this same information to each of its customers for the product; and 3) Request its customers to notify their employees, customers, and other users of the product of this information.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 IDENTIFICATION

Product Name	ETHANOL, SDA-2B (HEPTANE) 200 PROOF SPEC
Chemical Name	Denatured Ethyl Alcohol
Chemical Family	Alcohols
Formula	Not applicable (mixture)
Synonym	Ethyl Alcohol SDA 2B-Heptane 200 Proof

1.2 COMPANY IDENTIFICATION

Union Carbide Corporation
A Subsidiary of The Dow Chemical Company
39 Old Ridgebury Road
Danbury, CT 06817-0001

1.3 EMERGENCY TELEPHONE NUMBER

24 hours a day: CHEMTREC 1-800-424-9300.
Number for non-emergency questions concerning MSDS (732) 563-5522
Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

2. COMPOSITION INFORMATION

Component	CAS #	Amount (%W/W)
Ethanol	64-17-5	99.14%
Heptane	142-82-5	0.86%

3. HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Appearance Transparent colorless

Physical State Liquid

Odor Fragrant

Hazards of product WARNING! FLAMMABLE.
CAUSES EYE IRRITATION.

3.2 POTENTIAL HEALTH EFFECTS

Effects of Single Acute Overexposure

Inhalation High vapor concentrations may cause a burning sensation in the nose and throat, and stinging and watering in the eyes. At concentrations which cause irritation, dizziness, faintness, drowsiness, nausea, and vomiting may also occur.

Eye Contact May cause irritation, experienced as stinging with excess blinking and tear production. Excess redness of the conjunctiva may occur.

Skin Contact No evidence of harmful effects from available information.

Skin Absorption No harmful effects with normal skin. However, potentially harmful amounts of material may be absorbed across markedly damaged skin when contact is sustained, particularly with children.

Swallowing May cause dizziness, faintness, drowsiness, decreased awareness and responsiveness, euphoria, abdominal discomfort, nausea, vomiting, staggering gait, lack of coordination, and coma.

Chronic, Prolonged or Repeated Overexposure

Effects of Repeated Overexposure Long-term repeated oral exposure to ethanol may result in the development of progressive liver injury with fibrosis.

Other Effects of Overexposure Repeated ingestion of ethanol by pregnant mothers has been shown to adversely affect the central nervous system of the fetus, producing a collection of effects which together constitute the fetal alcohol syndrome. These include mental and physical retardation, disturbances of learning, motor and language deficiencies, behavioral disorders, and small size head.

Medical Conditions Aggravated by Exposure

Repeated exposure to ethanol may aggravate liver injury produced from other causes.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

See Section 12 for Ecological Information.

4. FIRST AID PROCEDURES

4.1 INHALATION

Remove to fresh air. Give artificial respiration if not breathing. If breathing is difficult, oxygen may be given by qualified personnel. Obtain medical attention.

4.2 EYE CONTACT

Immediately flush eyes with water and continue washing for several minutes. Remove contact lenses, if worn. Obtain medical attention if discomfort persists.

4.3 SKIN CONTACT

Wash skin with soap and water.

4.4 SWALLOWING

If patient is fully conscious, give two glasses of water. Induce vomiting. This should be done only by medical or experienced first-aid personnel. Obtain medical attention.

4.5 NOTES TO PHYSICIAN

Symptoms vary with the alcohol level of the blood. Mild alcohol intoxication occurs at blood levels between 0.05%-0.15% and approximately 25% of individuals will show signs of intoxication at these levels. Above 0.15% the person is definitely under the influence of ethanol and 50%-95% of individuals at this level are clinically intoxicated. Severe poisoning occurs when the blood ethanol level is 0.3%-0.5%. Above 0.5% the individual will be comatose and death can occur. The unabsorbed ethanol should be removed by gastric lavage after intubating the patient to prevent aspiration. Avoid the use of depressant drugs or the excessive administration of fluids. In the presence of hypoglycemia, administer 5%-10% glucose intravenously, plus thiamine 100 mg intramuscularly. Hemodialysis is indicated if the blood ethanol is above 5 mg/ml. Naloxone may be useful to reverse clinical alcoholic coma and 0.4-1.2 mg intravenously may arouse ethanol-intoxicated patients.

5. FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Flash Point - Closed Cup: *Tag Closed Cup ASTM D 56* **13 °C 55 °F**

Flash Point - Open Cup: *Tag Open Cup ASTM D 1310* **18 °C 65 °F**

Autoignition Temperature: *Not currently available.*

Flammable Limits In Air:

Lower	**3.3 %(V)** (Ethanol)
Upper	**19.0 %(V)** (Ethanol)

5.2 EXTINGUISHING MEDIA

Extinguish fires with water spray or apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

5.3 EXTINGUISHING MEDIA TO AVOID

No information currently available.

5.4 SPECIAL FIRE FIGHTING PROCEDURES

Use water spray to cool fire-exposed containers and structures.

5.5 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Use self-contained breathing apparatus and protective clothing.

5.6 UNUSUAL FIRE AND EXPLOSION HAZARDS

Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges, or other ignition sources at locations distant from product handling point.
Vapors from this material may settle in low or confined areas or travel a long distance to an ignition source and flash back explosively.
Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Special precautions may be necessary to dissipate static electricity for non-conductive containers. Use proper bonding and grounding during product transfer as described in National Fire Protection Association Document NFPA 77.
Avoid splash filling of containers when handling this flammable liquid because static electricity may be generated. Use proper bonding and grounding during product transfer as described in National Fire Protection Association Document NFPA 77.
See Section 8.3 - Engineering Controls

This material may produce a floating fire hazard.
Flame may be invisible. Approach fire with caution.

5.7 HAZARDOUS COMBUSTION PRODUCTS

Burning can produce the following products: Carbon monoxide and/or carbon dioxide. Carbon monoxide is highly toxic if inhaled. Carbon dioxide in sufficient concentrations can act as an asphyxiant.

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled:
Extinguish and do not turn on any ignition source until the area is determined to be free from fire or explosion hazard. Small spills can be flushed with large amounts of water; larger spills should be collected for disposal. Observe government regulations.

Personal Precautions: Wear suitable protective equipment. See Section 8.2 - Personal Protection.

7. HANDLING AND STORAGE

7.1 HANDLING

General Handling
Keep away from heat, sparks and flame.

Avoid breathing vapor.
Avoid contact with eyes.
Keep container closed.
Use with adequate ventilation.
Vapor forms from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from product handling point and may flash back explosively.
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY.

Ventilation
General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation is needed at points where vapor can be expected to escape to the workplace air.

Other Precautions
Vapor may settle in low or confined areas, or travel a long distance to an ignition source and flash back explosively.

7.2 STORAGE

Store in accordance with good industrial practices. Storage information may be obtained from product-specific Union Carbide Storage and Handling Guides, or by calling a Union Carbide Customer Service Representative.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Component	Exposure Limits	Skin	Form
Ethanol	1000 ppm TWA8 ACGIH 1880 mg/m3 TWA8 ACGIH 1000 ppm TWA8 OSHA 1900 mg/m3 TWA8 OSHA		
Heptane	1640 mg/m3 TWA8 ACGIH 400 ppm TWA8 ACGIH 2050 mg/m3 STEL ACGIH 500 ppm STEL ACGIH		
Heptane	1600 mg/m3 TWA8 OSHA-Vacated 400 ppm TWA8 OSHA-Vacated		

2000 mg/m3 STEL OSHA-Vacated
500 ppm STEL OSHA-Vacated
500 ppm TWA8 OSHA
2000 mg/m3 TWA8 OSHA

In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.

A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin Column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.

8.2 PERSONAL PROTECTION

Respiratory Protection:	Use self-contained breathing apparatus in high vapor concentrations.
Ventilation:	General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation is needed at points where vapor can be expected to escape to the workplace air.
Eye Protection:	Safety Glasses
Protective Gloves:	Neoprene Polyvinyl chloride coated
Other Protective Equipment:	Eye Bath, Safety Shower

8.3 ENGINEERING CONTROLS

PROCESS HAZARD: Sudden release of hot organic chemical vapor or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapor."

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Appearance: Transparent colorless

pH: *Not currently available.*

Solubility in Water (by weight): *25 °C* **100 %**

Odor: Fragrant

Flash Point - Closed Cup: *Tag Closed Cup ASTM D 56* **13 °C 55 °F**

Flash Point - Open Cup: *Tag Open Cup ASTM D 1310* **18 °C 65 °F**

Percent Volatiles: **100 Wt%**

Boiling Point (760 mmHg): **77 - 80 °C 171 - 176 °F**

Freezing Point: **< -100 °C < -148 °F**

Specific Gravity (H2O = 1): **0.791** *20 °C / 20 °C*

Vapor Pressure at 20°C: **5.9 kPa 45 mmHg**

Vapor Density (air = 1): **1.6**

Evaporation Rate (Butyl Acetate = 1): **3.4**

Melting Point: *Not applicable.*

10. STABILITY AND REACTIVITY

10.1 STABILITY/INSTABILITY Stable

Incompatible Materials: Concentrated nitric or sulfuric acid; strong oxidizing agents.

10.2 HAZARDOUS POLYMERIZATION Will Not Occur.

10.3 INHIBITORS/STABILIZERS *Not applicable.*

11. TOXICOLOGICAL INFORMATION

SIGNIFICANT DATA WITH POSSIBLE RELEVANCE TO HUMANS

The International Agency for Research on Cancer (IARC) has determined that the consumption of alcoholic beverages is causally related to the occurrence of malignant tumors of the oral cavity, pharynx, larynx, esophagus and liver in humans. The carcinogenic response attributed to drinking alcoholic beverages has not been verified in studies with laboratory animals. Established uses of denatured ethanol and non-beverage uses of pure ethanol are not considered to pose any significant cancer hazard. Ethanol has been shown to have a weak skin sensitizing potential in a very small percentage of the population.

12. ECOLOGICAL INFORMATION

12.1 ENVIRONMENTAL FATE

Information may be available, call Union Carbide.

12.2 ECOTOXICITY

Information may be available, call Union Carbide.

12.3 FURTHER INFORMATION

None.

13. DISPOSAL CONSIDERATIONS

13.1 WASTE DISPOSAL METHOD

Incinerate in a furnace where permitted under Federal, State, and local regulations. Dispose in accordance with all applicable Federal, State, and local environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

13.2 DISPOSAL CONSIDERATIONS

See Section 13.1

Disposal methods identified are for the product as sold. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permissible under applicable rules, regulations and/or laws governing your location.

14. TRANSPORT INFORMATION

14.1 U.S. D.O.T.

NON-BULK
Proper Shipping Name : ETHANOL SOLUTION
Technical Name : DENATURED ETHANOL
ID Number : UN 1170
Hazard Class : 3
Packing Group : PG II

BULK
Proper Shipping Name : ETHANOL SOLUTION
Technical Name : DENATURED ETHANOL
ID Number : UN 1170
Hazard Class : 3
Packing Group : PG II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

15.1 FEDERAL/NATIONAL

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 SECTION 103 (CERCLA)

The following components of this product are specifically listed as hazardous substances in 40 CFR 302.4 (unlisted hazardous substances are not identified) and are present at levels which could require reporting:

Component	CAS #	Amount
Methanol	67-56-1	<= 0.0060%
Acetaldehyde	75-07-0	<= 0.0010%
Acetone	67-64-1	<= 0.0002%

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTIONS 302 AND 304

The following components of this product are listed as extremely hazardous substances in 40 CFR Part 355 and are present at levels which could require reporting and emergency planning:

None.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTION 313

The following components of this product are listed as toxic chemicals in 40 CFR 372.65 and are present at levels which could require reporting and customer notification under Section 313 and 40 CFR Part 372:

None.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTIONS 311 AND 312

Delayed Hazard : Yes
Fire Hazard : Yes
Immediate Health Hazard : Yes
Reactive Hazard : No
Sudden Release of Pressure Hazard : No

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

15.2 STATE/LOCAL

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT-TO-KNOW ACT)

This product is subject to the Worker and Community Right-to-Know Act. The following components of this product are at levels which could require identification in the MSDS:

Component	CAS #	Amount
Ethanol	64-17-5	<= 99.1400%

MASSACHUSETTS (HAZARDOUS SUBSTANCES DISCLOSURE BY EMPLOYERS)

The following components of this product appear on the Massachusetts Substance List and are present at levels which could require identification in the MSDS:

Component	CAS #	Amount
Ethanol	64-17-5	<= 99.1400%
Acetaldehyde	75-07-0	<= 0.0010%

CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986)

This product contains the following chemical(s) known to the State of California to cause cancer:

Component	CAS #	Amount
Acetaldehyde	75-07-0	<= 0.0010%

CALIFORNIA SCAQMD RULE 443.1 (SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 443.1, LABELING OF MATERIALS CONTAINING ORGANIC SOLVENTS)

VOC: Not determined.

This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.

16. OTHER INFORMATION

16.1 AVAILABLE LITERATURE AND BROCHURES

ADDITIONAL INFORMATION: There may be additional product safety information on this product, which may be obtained by calling your Union Carbide Corporation Sales or Customer Service Contact.

16.2 SPECIFIC HAZARD RATING SYSTEM

Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

16.3 RECOMMENDED USES AND RESTRICTIONS

FOR INDUSTRY USE ONLY

16.4 REVISION

Version: 2.
Revision: 09/19/2000
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

16.5 LEGEND

A	Asphyxiant
Bacterial/NA	Non Acclimated Bacteria
F	Fire
H	Health
HMIS	Hazardous Materials Information System
N/A	Not available
NFPA	National Fire Protection Association
O	Oxidizer
P	Peroxide Former
R	Reactivity
TS	Trade Secret
VOL/VOL	Volume/Volume
W	Water Reactive
W/W	Weight/Weight

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of the use of the product are not under the control of Union Carbide, it is the user's obligation to determine conditions of safe use of the product.

ARCOPURE® (HIGH PURITY MTBE)

SECTION 1: IDENTIFICATION

Product Name: ARCOPURE® (HIGH PURITY MTBE)

Product Number: 000000000000499115

Internal ID: 354-1

Chemical Family: Alkyl ethers

CAS Number: 1634-04-4

Chemical Name: t-Butyl Methyl Ether

Synonyms: High Purity Tert-Butyl Methyl Ether, High Purity MTBE, Tert-Butyl Methyl Ether

Manufacturer
Lyondell Chemical Company
One Houston Center, Suite 1600
1221 McKinney St.
P.O. Box 2583
Houston Texas 77252-2583

Business Contact
Customer Service 888 777-0232
Product Safety 800 700-0946

24 Hour Emergency Contact
CHEMTREC 800 424-9300
LYONDELL 800-245-4532

SECTION 2 : COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS #	EU Inventory	Concentration Wt.%*	Risk	Symbol
t-Butyl Methyl Ether	1634-04-4	216-653-1	> 99.9	R11, R38	F, Xi

* Concentration of gaseous products or materials is given in Mole %

Compositions given are typical values not specifications.

SECTION 3: HAZARD IDENTIFICATION

Emergency Overview

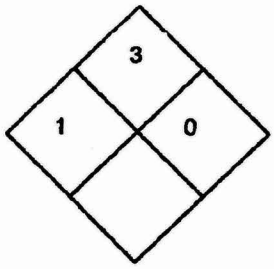
This material is HAZARDOUS by OSHA Hazard Communication definition.

Signal Word
DANGER.

Hazards
Extremely flammable liquid. Eye irritant. Skin irritant. Not expected to be a skin absorption hazard. Not expected to be a sensitizer. Mucous membrane irritant. Inhalation hazard. Aspiration hazard. CNS depressant. Unpleasant terpentine-like taste in water.

ARCOPURE® (HIGH PURITY MTBE)

NFPA®



HMIS®

Health	1
Flammability	3
Reactivity	0

Physical State
Liquid.

Color
Clear, colorless.

Odor
Terpentine-like odor.

Odor Threshold
0.053 ppm / Odor is not an adequate warning of potentially hazardous ambient air concentrations. Some individuals find the odor of MTBE objectionable (threshold for detection in air approx. 0.0002 mg/l; 0.053 ppm). Odor/taste threshold in water has been reported to be less than 5 ppb.

Potential Health Effects

Routes of Exposure
Skin. Eye Inhalation

Signs and Symptoms of Acute Exposure
See component summary.

- *t-Butyl Methyl Ether 1634-04-4*

Eye irritant. Moderate skin irritant. Not a skin absorption hazard. Mucous membrane irritant. Overexposure may produce anesthetic or narcotic effects. Aspiration hazard.

Skin
May cause moderate skin irritation. Not expected to be a skin absorption hazard. Not expected to be a sensitizer.

Inhalation
Vapors may cause irritation of the eyes, nose and throat as well as CNS depression (fatigue, dizziness, loss of concentration, with collapse, coma and death possible in cases of severe overexposure). High vapor concentrations may be irritating to the upper respiratory tract.

Eye
Contact with the eyes may cause irritation consisting of reversible redness, swelling and mucous discharge to the conjunctiva.

Ingestion
Ingestion may cause discomfort and irritation of the gastrointestinal tract and CNS depression (fatigue, dizziness, collapse, coma and death). Aspiration into the lung may cause fatal chemical pneumonitis.

Chronic Health Effects
See component summary.

- *t-Butyl Methyl Ether 1634-04-4*

Breathing mist or vapors may cause mucous membrane or upper respiratory tract irritation. Prolonged exposure may produce anesthetic and narcotic effects. Repeated or prolonged contact with skin may cause defatting and drying of the skin which may result in dermatitis. Chronic animal toxicity studies exposing rats and mice to MTBE have been performed. A description of these studies and an assessment of their results is presented elsewhere in this document. See section 11.

Conditions Aggravated by Exposure
Medical information regarding special health effects is not conclusive. This material may aggravate pulmonary/bronchial disease and/or cause breathing difficulty.

SECTION 4: FIRST AID MEASURES

General
Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. For specific information refer to the Emergency Overview in Section 3 of this MSDS., Assess rapidly and aggressively., Resuscitation may be indicated.

Skin
Promptly remove soiled clothing/wash thoroughly before reuse. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first. Seek medical attention if ill effect or irritation develops.

Inhalation
If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain medical attention if breathing difficulty persists.

Eye
Immediately flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower lids. If pain or irritation persists, promptly obtain medical attention.

Ingestion
If large quantity swallowed, give lukewarm water (pint/ 1/2 litre) if victim completely conscious/alert. Do not induce vomiting. Risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.

Note to Physician
There is no specific antidote. Do not induce vomiting. However, if vomiting occurs spontaneously, maintain open airway. Gastrointestinal decontamination in accidental petroleum distillate ingestions is not recommended, because of the severe aspiration hazard. All contaminated clothing should be removed, and contaminated skin areas washed with lipophilic soap, or green soap, and water. Gastric lavage is indicated in those patients who require decontamination. Be sure that an endotracheal tube is in place prior to lavage; use cuffed tubes in patients over 7 years of age. Although activated charcoal does not bind petroleum distillate products and may induce vomiting, charcoal may be administered when the physician feels the charcoal may absorb a toxic additive. A chest x-ray should be taken immediately after stabilization of breathing and circulation to document aspiration and detect the presence of pneumothorax. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5: FIRE FIGHTING MEASURES

Flammable Properties

Classification
OSHA/NFPA Class IB Flammable Liquid.

Flash Point:
~ -28 °C (-18.4 °F) (SETA)

Auto-Ignition Temperature
~ 374 °C (705.2 °F)

Lower Flammable Limit
~ 1.3 vol%

Upper Flammable Limit

~ 8 vol%

Extinguishing Media

Suitable: SMALL FIRE: Use dry chemicals, CO2, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water fog or alcohol-resistant foam.

Unsuitable: Do not use solid water stream/may spread fire.

Protection of Firefighters

Protective Equipment/Clothing: Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters protective clothing will only provide limited protection.

Fire Fighting Guidance: Releases flammable vapors below normal ambient temperatures. Flammable vapors may be heavier than air. May travel long distances along the ground before igniting and flashing back to vapor source. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Move containers from fire area if you can do it without risk. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not use straight streams. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Hazardous Combustion Products: Thermal decomposition may produce carbon monoxide and other toxic vapors.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Release Response
Extremely flammable liquid. Release can cause fire or explosion. Eliminate all sources of ignition. All equipment used when handling this product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. Water spray may reduce vapor; but may not prevent ignition in closed spaces. Dike large spills and place materials in salvage containers.

MTBE is highly volatile, partially water soluble and has only a minimal tendency to adhere to soil particles. Even small volumes can pose a threat to the environment and nearby water resources. Surface spills can reach groundwater through porous soil or cracked surfaces. All efforts should be made to prevent any leaks or spills, and to protect water resources. Where spills are possible, a comprehensive spill response plan should be developed and implemented. If a leak or spill reaches the groundwater, the groundwater may become contaminated. If the groundwater is a source of drinking water, the associated drinking water well(s) could become contaminated. MTBE can impart an unpleasant taste and odor to water at very low concentrations.

SECTION 7: HANDLING AND STORAGE

Handling
For industrial use only. Keep container tightly closed when not in use. Extinguish all ignition sources. Wear recommended personal protective equipment. Containers must be properly grounded before beginning transfer. All electrical equipment should be grounded and conform to applicable electric codes and regulatory requirements. Check atmosphere for explosiveness and oxygen deficiencies. Observe precautions pertaining to confined space entry. Use only non-sparking tools. Carefully vent any internal pressure before removing closure. Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair. Handle empty containers with care; vapor/residue may be flammable.

Storage
Store only in tightly closed, properly vented containers away from heat, sparks, open flame and strong oxidizing agents. Soft steel; avoid most plastics, Viton and Flourel. Store closed drums with bung in up position. Vapor space above stored liquid may be flammable/explosive unless blanketed with inert gas.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

Both local exhaust and good general room ventilation must be provided not only to control exposure but also to prevent formation of flammable mixtures.

Personal Protection

Inhalation A respiratory protection program that meets OSHA's 29 CFR 1910.134 or ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use. Use an approved respirator, either air-supplied or air purifying (consult your company safety professional, or Lyondell Industrial Hygiene group for guidance). The type of respiratory protection will depend upon whether the maximum exposure concentration is known.

Skin Wear chemical resistant gloves such as: Nitrile. or Polyvinyl Alcohol. Depending on the conditions of use, protective gloves, apron, boots, head and face protection should be worn.

Eye Eye protection such as chemical splash goggles and/or face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapor.

Additional Remarks

Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing/wash thoroughly before reuse.

Occupational Exposure Limits

Component Name	Source / Date	Value	Type	Notation
t-Butyl Methyl Ether	US (ACGIH) / 2003	50 ppm	8 HRS/TWA	No
	US (OSHA) / 2003	N/L		

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid. Clear, colorless.

Odor: Terpentine-like odor.

Odor Threshold: 0.053 ppm Odor is not an adequate warning of potentially hazardous ambient air concentrations. Some individuals find the odor of MTBE objectionable (threshold for detection in air approx. 0.0002 mg/l; 0.053 ppm). Odor/taste threshold in water has been reported to be less than 5 ppb.

pH: Not applicable.

Boiling Point/Boiling Range: ~ 55 °C (131 °F) @ 760 mm Hg

Freezing Point/Melting Point: ~ -109 °C (-164.2 °F)

Flash Point: ~ -28 °C (-18.4 °F) (SETA)

Auto-Ignition: ~ 374 °C (705.2 °F)

Flammability: OSHA/NFPA Class IB Flammable Liquid.

Lower Flammable Limit: ~ 1.3 vol%

Upper Flammable Limit: ~ 8 vol%

Explosive Properties: Not Applicable.

Oxidizing Properties: Not Applicable.

Vapor Pressure: ~ 245 mm Hg @ 25 °C (77 °F)

Evaporation Rate: No Data Available.

Relative Density: ~ 0.74 @ 20 °C (68 °F) (Water = 1.0 at 4°C (39.2°F))

Relative Vapor Density: ~ 3 @ 20 °C (68 °F) (Air = 1.0)

Viscosity: ~ 0.3 mPa.s @ 25 °C (77 °F)

Solubility (Water): Moderate (1 to less than 10 Percent).

Partition Coefficient (Kow): Log Pow = -0.8 to -1.33

Additional Physical and Chemical Properties: Additional properties may be listed in Sections 3 and 5.

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability
This material is stable when properly handled and stored.

Conditions to Avoid
Heat, sparks, open flame, other ignition sources, and oxidizing conditions.

Substances to Avoid
Strong oxidizing agents. Strong acids.

Hazardous Polymerization
Not expected to occur.

Reactions with Air and Water
Not expected to occur.

SECTION 11: TOXICOLOGICAL INFORMATION

PRODUCT INFORMATION

Product Summary
MTBE is of slight acute toxicity, although inhalation exposure to high concentrations may cause dizziness, CNS depression, loss of consciousness and irritation to the eye and upper respiratory tract. Some individuals find the odor of MTBE objectionable. Skin contact with undiluted product may lead to moderate irritation, while repeated exposure can cause cracking due to defatting of the dermis. It is not a skin sensitizer. Neat liquid MTBE may cause mild, reversible eye irritation. Liver enlargement, without evidence of structural organ damage, is commonly seen in rats and mice after repeated exposure, while male rats exhibit a sex- and species-specific accumulation of protein droplets in proximal tubules of the kidney. Changes in estrogen-sensitive tissues were reported in female mice exposed to high concentrations of MTBE vapor, however serum estrogen levels and estrogen receptor functions were unaffected. MTBE has no adverse effect on reproduction and is not selectively toxic to the fetus. Although formaldehyde is a possible metabolite that may be formed in simple in vitro systems, results from in vivo genotoxicity tests are consistently negative. Long term inhalation exposure to very high doses was associated with an increased incidence of liver tumors in female mice and kidney- and testis tumors in male rats.

COMPONENT INFORMATION

- *t-Butyl Methyl Ether 1634-04-4*

Acute Toxicity - Lethal Doses

LC50 (Inhl)	Rat	23,800 - 39,800 PPM	4 HOURS
LD50 (Oral)	Rat	3800 MG/KG	
LD50 (Skin)	Rabbit.	> 10,000 MG/KG	

Target Organ Effects
Skin. Eye. Respiratory system. CNS depressant.

Repeated Dose Toxicity
No evidence of adverse systemic effects was seen in rodents exposed repeatedly to low concentrations of MTBE vapor, however higher exposures were associated with an accumulation of protein droplets in the kidney of male rats (a male rat-specific response), with liver enlargement (but no adverse histopathological lesions) in rats and mice of both sexes. A decreased incidence of cystic endometrial hyperplasia and changes in other estrogen-sensitive tissues were reported in female mice exposed to28.6 mg/l (8,000 ppm) MTBE vapor, however serum estrogen levels and estrogen receptor functions were unaffected. There are inconsistent reports of minor subjective neurological symptoms in humans regularly exposed to low levels of MTBE vapor. It is unclear, however, if these are causally-related to MTBE or where triggered by its odor. Some individuals find the odor of MTBE objectionable (threshold for detection 0.0002 mg/l; 0.053 ppm).

Reproductive Effects
No adverse effect on reproductive function or gonad histopathology seen in male and female rats exposed to 28.6 mg/l (8,000 ppm) MTBE vapor over two generations.

Developmental Effects
MTBE is not selectively toxic to the fetus. No adverse developmental effects were reported in rabbits exposed to high concentrations during pregnancy, despite the occurrence of maternal toxicity (CNS effects, significantly lower food intake, significantly lower maternal body weight). Similar maternal signs were noted in mice exposed under similar conditions, however in this instance an increased incidence of cleft palate was apparent in the offspring. Cleft palate is a stress-related phenomenon in the mouse hence this observation was considered secondary to maternal toxicity in this species.

Genetic Toxicity
MTBE has been tested extensively for genotoxic activity in a range of in vitro and in vivo tests. While the majority of results are negative, weak positive findings (consistent with the metabolism of MTBE to formaldehyde by S9 fraction in vitro) have been obtained with Salmonella typhimurium TA102 and L5178Y TK+/- mouse lymphoma cells. Consistently negative results have been obtained from in vivo tests, however, and indicate that formation of free formaldehyde in the body is negligible. Overall, the weight of evidence indicates that MTBE is not a genotoxin.

Carcinogenicity
Studies in experimental animals have found only limited evidence for the carcinogenicity for MTBE, with tumors occurring in tissues or via mechanisms considered not relevant to humans. Female mice exposed by inhalation to up to 28.6 mg/l (8,000 ppm) MTBE vapor responded with an increased incidence of liver tumors, while male rats developed tumors in testis and kidney under similar conditions. Mechanistic studies have shown important differences in the disposition and fate of MTBE in rodents and humans, suggesting that these findings after long-term inhalation exposure are not indicative of a risk to health. Results are also available from a life-time study of non-standard design, which reported an increased incidence of combined lymphoma/leukemia in female rats given MTBE by gavage, however inadequacies in the design and reporting of this investigation limit confidence in the result. Critically, MTBE is not genotoxic indicating that a direct effect on DNA is unlikely. Listed by IARC as not classifiable as to its carcinogenicity to humans (Group 3). This listing is based on inadequate evidence in humans and limited evidence of carcinogenicity in experimental animals.

SECTION 12: ECOLOGICAL INFORMATION

PRODUCT INFORMATION

Ecotoxicity

This material is expected to be non-hazardous to aquatic species. See component summary.

Environmental Fate and Pathway

MTBE presents a potential concern to groundwater supplies. Small amounts (by some accounts in the below one part per billion range) of MTBE or gasoline blended with MTBE may impart an unpleasant and distasteful odor and taste to groundwater which can render such groundwater unsuitable for consumption. Therefore, care should be used when handling, storing or transferring MTBE or gasoline blended with MTBE to insure that such product is not released into the environment and is not allowed to migrate to groundwater. Because of its solubility in water (4.3%) and relatively low organic carbon partitioning coefficient (Koc=11), MTBE is mobile in soil and, accordingly, every release into the environment has the potential for damaging groundwater supplies. Once in the groundwater, MTBE tends to migrate faster and farther than most other hydrocarbons and is typically present at the leading edge of a groundwater contaminant plume. MTBE may not biodegrade as promptly as other gasoline constituents and may require additional and more costly remediation procedures. Other information regarding MTBE is available through the Chemical Abstracts Service, American Petroleum Institute publications, the U.S. Environmental Protection Agency and elsewhere.

Other Adverse Effects
This material does not adhere readily to soil particles and may travel rapidly and extensively in a groundwater plume. Therefore, groundwater remediation efforts may be difficult and extensive. As a VOC, MTBE can contribute to the formation of photochemical smog in the presence of other VOC's.

COMPONENT INFORMATION

- *t-Butyl Methyl Ether 1634-04-4*

Ecotoxicity

This material is expected to be non-hazardous to aquatic species.

Acute toxicity to fish
LC50 / 96 HOURS fathead minnow 672 - 980 mg/l

LC50 / 96 HOUR rainbow trout. 887 mg/l

LC50 / 96 HOUR bluegill sunfish 1,054 mg/l

LC50 / 96 HOUR silverside minnow. 574 mg/l

LC50 / 96 HOUR sheepshead minnow. 1,358 mg/l

Acute toxicity to aquatic invertebrates
EC50 / 48 HOUR Daphnia magna. 472 - 681 mg/l

LC50 / 48 HOUR waterflea. 340 mg/l

EC50 / 96 HOUR saltwater mysid. 136 - 187 mg/l

Toxicity to aquatic plants
IC50 / 96 HOUR green algae (Selenastrum). 491 mg/l

Toxicity to microorganisms

Summary: No Data Available.

Chronic toxicity to fish
IC50 / 31 DAY fathead minnow 279 mg/l

Chronic toxicity to aquatic invertebrates
NOEC50 / 28 DAY saltwater mysid. 26 mg/l
Summary: May pose slight chronic toxicity in specific invertebrates.

Environmental Fate and Pathway

MTBE presents a potential concern to groundwater supplies. Small amounts (by some accounts in the below one part per billion range) of MTBE or gasoline blended with MTBE may impart an unpleasant and distasteful odor and taste to groundwater which can render such groundwater unsuitable for consumption. Therefore, care should be used when handling, storing or transferring MTBE or gasoline blended with MTBE to insure that such product is not released into the environment and is not allowed to migrate to groundwater. Because of its solubility in water (4.3%) and relatively low organic carbon partitioning coefficient (Koc=11), MTBE is mobile in soil and, accordingly, every release into the environment has the potential for damaging groundwater supplies. Once in the groundwater, MTBE tends to migrate faster and farther than most other hydrocarbons and is typically present at the leading edge of a groundwater contaminant plume. MTBE may not biodegrade as promptly as other gasoline constituents and may require additional and more costly remediation procedures. Other information regarding MTBE is available through the Chemical Abstracts Service, American Petroleum Institute publications, the U.S. Environmental Protection Agency and elsewhere.

Mobility
Transport between environmental compartments: The atmosphere is the main environmental compartment for releases of MTBE. In water, volatilization will result in substantial losses to the atmosphere with a half-life of 5-6 days.

Persistance and Degradability
Biodegradation: Two OECD 301D studies (closed bottle test) showed negligible (0-2%) biodegradation after 28 days. Not readily biodegradable under aerobic conditions. However, degradation has been observed in non-standard tests using pure- and mixed bacterial cultures.

Bioaccumulation: Log Kow (Fish) <3 This material is not expected to bioaccumulate.

Other Adverse Effects
This material does not adhere readily to soil particles and may travel rapidly and extensively in a groundwater plume. Therefore, groundwater remediation efforts may be difficult and extensive. As a VOC, MTBE can contribute to the formation of photochemical smog in the presence of other VOC's.

SECTION 13: DISPOSAL CONSIDERATIONS

Contaminated products/soil/water may be Resource Conservation and Recovery Act (RCRA)hazardous waste/Occupational Safety and Health Administration (OSHA) hazardous material due to low flash point (see 40 Code of Federal Regulations (CFR) 261 and 29 CFR 1910). Assure effluent complies with applicable regulations. Landfill solids at permitted sites. Use registered transporters. Burn concentrated liquids in systems designed for low flash point material. Avoid flame-outs. Assure emissions comply with applicable regulations. Avoid overloading/poisoning plant biomass. Dilute aqueous waste may biodegrade.

SECTION 14: TRANSPORT INFORMATION

Proper Shipping Name		
	CFR_RAIL	Methyl tert-butyl ether
	IMDG	METHYL BUTYL ETHER
RQ		Methyl tert-butyl ether
ID No.	CFR_RAIL	UN2398
ID No.	IMDG	UN2398
Hazard Class	CFR_RAIL	3
Hazard Class	IMDG	3
PG	CFR_RAIL	II
PG	IMDG	II

SECTION 15: REGULATORY INFORMATION

Regulatory Status

ARCOPURE® (HIGH PURITY MTBE)

Country	Inventory	
Australia	AICS	X
Canada	DSL	X
Canada	NDSL	
China	IECS	X
European Union	EINECS	X
European Union	ELINCS	
European Union	NLP	
Japan	ENCS	X
Korea	ECL	X
Philippines	PICCS	X
United States	TSCA	X

X = All components are included or are otherwise exempt from inclusion on this inventory.

C = Contact Lyondell/Equistar by e-mail at product.safety@lyondell.com or product.safety@equistarchem.com for additional information.

If identified components of this product are listed under the TSCA 12(b) Export Notification rule, they will be listed below.

SARA 302/304

This material contains a component(s) with known CAS numbers classified as hazardous substances subject to the reporting of CERCLA (40 CFR 302) and/or to the release reporting requirements of SARA (Section 302) based on reportable quantities (RQs).

Component	RQ
Methyl Tertiary Butyl Ether / CAS# 1634-04-4.	1,000 lbs

SARA 311/312

Based upon available information, this material is classified as the following health and/or physical hazards according to Section 311 & 312:

Fire Hazard.
Immediate (Acute) Health Hazard.

SARA 313

This material contains the following chemicals with known CAS numbers subject to the reporting requirements of SARA Title III, Section 313 and 40 CFR 372:

Component	Reporting Threshold
Methyl t-Butyl Ether / CAS# 1634-04-4	1.0%

State Reporting

This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins under California Proposition 65 at levels which would be subject to the proposition.

Massachusetts Substances List (MSL) - Hazardous substances on the MSL must be identified when present in materials at levels greater than state specified criterion. The criterion is: >= 1%. Components with CAS numbers present in this material at a level which could require reporting under the statute are:

- Methyl Tertiary Butyl Ether / CAS# 1634-04-4.

Hazardous Substances listed by the State of Pennsylvania must be identified when present in materials at levels greater than the state specified criterion. The criterion is >= 1%. Components with CAS numbers in this material at a level which could require reporting under the statute are:

- Methyl Tertiary Butyl Ether / CAS# 1634-04-4.

ARCOPURE® (HIGH PURITY MTBE)

Environmentally Hazardous Substances listed by the State of Pennsylvania must be identified when present in materials at levels greater than the state specified criterion. The criterion is >= 1%. Components with CAS numbers in this material at a level which could require reporting under the statute are:

- Methyl Tertiary Butyl Ether / CAS# 1634-04-4.

SECTION 16: OTHER INFORMATION

Latest Revision(s)
Revised Section(s): 3 6 9 11 12 16 Date of Revision: October 2 2003

DISCLAIMER OF RESPONSIBILITY

This document is generated for the purpose of distributing health, safety, and environmental data. It is not a specification sheet nor should any displayed data be construed as a specification. The information on this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Product Specific Information
Further environmental, safety, use and handling information pertaining to this product is available within Lyondell's "MTBE Product Safety Bulletin", which can be obtained from Lyondell Chemical Company.

Numerical Data Presentation
The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example, 1,234.56 mg/kg = 1 234,56 mg/kg

Language Translations
The information presented in this document has been translated from English by a vendor Lyondell believes to be reliable. Lyondell and its vendor have made a good-faith effort to verify the accuracy of the translation, but assume no responsibility for any errors that may have occurred. Please refer to our web sites (www.lyondell.com and www.equistarchem.com) for the original document written in English.

< end of document >

COGNIS CORPORATION

Material Safety Data Sheet

SECTION 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

Revised: 05/10/2002
Supercedes: 09/04/2001

PRODUCT NAME: LOROL C8-98
PRODUCT DESCRIPTION: FATTY ALCOHOLS
SYNONYMS: 1-OCTANOL
OCTYL ALCOHOL
CASRN: 111-87-5
MANUFACTURER: Cognis Corporation
4900 Este Avenue
Cincinnati,OH 45232
Phone: 800-543-7370 Fax: 513-482-5505
EMERGENCY NUMBERS:
CHEMTREC: 800-424-9300

DISTRIBUTED BY:
STOCKTON SALES, INC.
1 Rossmoor Drive
Unit B – 3
Monroe Twp., NJ 08831
(609) 395-8700

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL	CONCENTRATION(Wt.%)	EXPOSURE LIMITS
1-Octanol CASRN 111-87-5	> 98.0	None Established

SECTION 3: HAZARDS IDENTIFICATION

********** Emergency **********
********** Overview **********

WARNING!
Combustible liquid and vapor.
Causes skin and eye irritation.
Keep away from heat, spark, and open flames.
Avoid contact with eyes, skin and clothing. Avoid breathing mist, vapour or dust. Keep container closed. Use with adaquate ventilation. Wash thoroughly after handling.

Colorless liquid

****

SKIN CONTACT:
May cause skin irritation, and may be harmful if absorbed through skin.

EYE CONTACT:
Contact with the eye causes irritation.

INHALATION:

Inhalation of mist or vapor may cause pulmonary edema or congestion. Inhalation may also cause central nervous system depression, and irritation of the respiratory system.

INGESTION:
May be harmful if swallowed. Avoid ingestion.

CHRONIC EFFECTS:
None Known.

OTHER HEALTH EFFECTS:
None known.

PRIMARY ROUTES OF EXPOSURE: Skin

SECTION 4: FIRST AID MEASURES

SKIN CONTACT:
Immediately flush skin with plenty of water while removing contaminated clothing. Get medical attention immediately. Wash contaminated clothing before reuse.

EYE CONTACT:
Flush eyes with plenty of water for at least 15 minutes. Do not permit victim to rub eyes. Get medical attention immediately.

INHALATION:
Immediately remove victim to fresh air. If victim has stopped breathing give artificial respiration, preferably, mouth to mouth. Get medical attention immediately.

INGESTION:
Do not induce vomiting. Give large amounts of water followed by milk if available. If vomiting should occur spontaneously, keep airway clear. Get medical attention. Never give anything by mouth to an unconscious person.

SECTION 5: FIRE FIGHTING MEASURES

Flash Point: 194 Deg F (Method Unknown)
LFL: Not Determined UFL: Not Determined
AUTOIGNITION TEMPERATURE Not Determined

RECOMMENDED EXTINGUISHING MEDIA:
Carbon dioxide,Dry chemical,Foam,Water spray

SPECIAL FIRE FIGHTING PROCEDURES:
Use water spray, dry chemical, foam or carbon dioxide. Water may be ineffective but should be used to keep fire exposed containers cool.

If a spill or leak has not ignited, use water spray to disperse the vapors. Water spray may be used to flush spills away from fire.

UNUSUAL FIRE OR EXPLOSION HAZARDS:
Perform only those fire fighting procedures for which you have been trained. Firefighters should wear self contained breathing apparatus in the positive pressure mode with a full facepiece when there is a possibility of exposure to smoke, fumes or hazardous decomposition products.

HAZARDOUS COMBUSTION PRODUCTS:
Decomposition may produce carbon monoxide and carbon dioxide.

SECTION 6: ACCIDENTAL RELEASE MEASURES

STEPS TO TAKE IN CASE OF SPILL OR LEAK:
Remove ignition sources. Add dry material to absorb spill (if large spill, dike to contain). Using recommended protective and explosion-proof equipment, pick up and containerize for recovery or disposal. Flush area with water, collect for disposal.

SECTION 7: HANDLING AND STORAGE

Do not store or handle product in the presence of heat, sparks, or open flame. Ground and bond container when transferring.

Container hazardous when empty. Since empty containers retain product residues, all hazard precautions described on this MSDS must be observed.

Avoid contact with eyes, skin and clothing. Avoid breathing mist, vapour or dust. Keep container closed. Use with adaquate ventilation. Wash thoroughly after handling.

FOR INDUSTRIAL USE ONLY.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION:
Chemical splash goggles or face shield.

SKIN PROTECTION:
Rubber or plastic gloves.

RESPIRATORY PROTECTION:
NIOSH/MSHA-approved respirator if necessary. Follow manufacturer's recommendations.

ENGINEERING CONTROLS:
Handle in the presence of adequate ventilation.

SECTION 9: PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid
APPEARANCE: Colorless liquid
ODOR: Mild
ODOR THRESHOLD: N/D
pH: Not Determined
MELTING POINT: -17 Deg C
BOILING POINT: 185-200 Deg C
SPECIFIC GRAVITY: .815-.825@ 20 C
SOLUBILITY IN WATER: Insoluble
PERCENT VOLATILES(by Wt.): NIL @ 70 Deg F.
VAPOR DENSITY: Heavier than Air
VAPOR PRESSURE: Not Determined
EVAPORATION RATE(N-BUTYL ACETATE=1): Not determined
VOC CONTENT(EPA Method 24): Not Determined

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Normally Stable

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBLE MATERIALS:
Strong acids, bases and oxidizing agents.

CONDITIONS TO AVOID:
Avoid contact with heat, sparks, flame and all sources of ignition.

HAZARDOUS DECOMPOSITION PRODUCTS:
Decomposition produces carbon monoxide and carbon dioxide.

SECTION 11: TOXICOLOGICAL INFORMATION

TYPE OF STUDY	RESULTS	SPECIES
ORAL LD(50)	>2000mg/kg	Rat
INHALATION LC(50)	5600 mg/m3	Rat

Similar materials are known to cause varying degrees of eye irritation.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL TOXICITY:
Not Determined

ENVIRONMENTAL FATE:
Not Determined

SECTION 13: DISPOSAL CONSIDERATIONS

All recovered material should be packaged, labeled, transported, and disposed or reclaimed in conformance with applicable laws and regulations and in conformance with Good Engineering Practices. Avoid landfilling of liquids. Reclaim where possible.

SECTION 14: TRANSPORTATION INFORMATION

COMBUSTIBLE LIQUID, N.O.S. (1-Octanol),
Combustible Liquid, NA1993, PG III, ERG# 128
ATTACHED, ALCOHOLS, INEDIBLE FATTY, NOI, OF
VEGETABLE OILS NMFC: 145100

The information provided is for domestic highway transportation only. This product may be regulated differently when shipped in other types of containers or by modes other than that addressed by this section of the MSDS. For information, please contact Regulatory Affairs at 513/482-5022.

For RQ applicability, please see Section XV.

SECTION 15: REGULATORY INFORMATION

TSCA INVENTORY STATUS:
This product and/or all of its components are either included on or exempt from the TSCA Inventory of Chemical Substances.

TSCA 12(b) COMPONENTS:
None

SARA 311/312 HAZARD CATEGORIES: Acute,Fire

SARA 313 TOXIC CHEMICALS:
None

SARA 302 EXTREMELY HAZARDOUS SUBSTANCES:
None

CERCLA HAZARDOUS SUBSTANCES:
None

CALIFORNIA PROPOSITION 65 COMPONENTS:
None

SECTION 16: OTHER INFORMATION

HMIS RATINGS: HEALTH: 2 FLAMMABILITY: 2 REACTIVITY: 0

NFPA RATINGS: HEALTH: 1 FLAMMABILITY: 2 REACTIVITY: 0 OTHER: None

THE FOLLOWING WARNING INFORMATION IS PROVIDED ON THE LABEL FOR THIS PRODUCT:

WARNING!
Combustible liquid and vapor.
Causes skin and eye irritation.
Keep away from heat, spark, and open flames.
FIRST AID - INHALATION:
Immediately remove victim to fresh air. If victim has stopped breathing give artificial respiration, preferably, mouth to mouth. Get medical attention immediately.
FIRST AID - SKIN CONTACT:
Immediately flush skin with plenty of water while removing contaminated clothing. Get medical attention immediately. Wash contaminated clothing before reuse.
FIRST AID - EYE CONTACT:
Flush eyes with plenty of water for at least 15 minutes. Do not permit victim to rub eyes. Get medical attention immediately.
STEPS TO TAKE IN CASE OF SPILL OR LEAK:
Remove ignition sources. Add dry material to absorb spill (if large spill, dike to contain). Using recommended protective and explosion-proof equipment, pick up and containerize for recovery or disposal. Flush area with water, collect for disposal.
HANDLING AND STORAGE:
Do not store or handle product in the presence of heat, sparks, or open flame. Ground and bond container when transferring.
Container hazardous when empty. Since empty containers retain product residues, all hazard precautions described on this MSDS must be observed.
Avoid contact with eyes, skin and clothing. Avoid breathing mist, vapour or dust. Keep container closed. Use with adaquate ventilation. Wash thoroughly after handling.
FOR INDUSTRIAL USE ONLY.

ABBREVIATIONS USED:

ND or N/D = Not Determined
NA or N/A = Not Applicable or Not Available
NE or N/E = Not Established
N/AP = Not Applicable

All information, recommendations, and suggestions appearing herein

concerning our product are based upon tests and data believed to be reliable. However, it is the user's responsibility to determine the safety, toxicity, and suitability for his own use of the product described herein. Since the actual use by others is beyond our control, no guarantee, express or implied, is made by Cognis Corporation as to the effects of such use, the results obtained, or the safety and toxicity of the product nor does Cognis Corporation assume any liability arising out of use, by others, of the product referred to herein. The information herein is not to be construed as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

PREPARED BY:
Robert E. Borgerding
Cognis Corporation
Product Safety/Regulatory Affairs
4900 Este Avenue
Cincinnati, OH 45232

513/482-2820(Voice) 513/482-2007(Fax)

Sasol North America Inc.
P.O. Box 19029
Houston Texas 77224-9029
Phone (281) 588-3000

sasol
reaching new frontiers

ALFOL® 6 ALCOHOL

MSDSCODE: ALF6
REVISION: 0702

REVISION DATE: 03/26/2003
PRINT DATE: 05/02/03

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME:	ALFOL® 6 ALCOHOL
SYNONYMS:	1-Hexanol, Hexyl Alcohol
MANUFACTURER:	Sasol North America Inc.
ADDRESS:	900 Threadneedle, Houston, TX 77079

TELEPHONE NUMBERS:	
CHEMTREC - Transportation Emergency (24-hr)	(800) 424-9300
Other Emergencies (24-hrs)	(337) 494-5142
MSDS and Product Information (8:00am-4:30pm CST)	(281) 588-3491
Health and Safety Information (8:00am-4:00pm CST)	(337) 494-5403

2. COMPOSITION / INFORMATION ON INGREDIENTS

Components

	CAS Number	Weight%
1-Hexanol	111-27-3	99.5

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

3. HAZARDS IDENTIFICATION

Emergency Overview

Colorless liquid. Sweet, pungent odor.

HEALTH HAZARD: WARNING! CAUSES EYE IRRITATION. Vapors may cause irritation of nose, throat, dizziness, and headache. Contact may irritate or burn skin and eyes.

FIRE OR EXPLOSION: COMBUSTIBLE LIQUID AND VAPOR. May be ignited by heat, sparks or flames. Vapors may travel to a source of ignition and flash back. Container may explode in heat of fire.

DISTRIBUTED BY:
STOCKTON SALES, INC.
1 Rossmoor Drive
Unit B – 3
Monroe Twp., NJ 08831
(609) 395-8700

Responsible Care®

Sasol North America Inc.
P.O. Box 19029
Houston, Texas 77224-9029
Phone (281) 588-3000

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reaching new frontiers

ALFOL® 6 ALCOHOL

MSDSCODE: ALF6
REVISION: 070Z

REVISION DATE: 03/26/2003
PRINT DATE: 05/02/03

Potential Health Effects

EYES:

Irritation may occur with exposure to vapors. This liquid is a strong contact irritant. May cause corneal inflammation.

SKIN:

Repeated or prolonged contact can cause redness, irritation, and scaling of the skin (dermatitis). Normal care and personal hygiene should prevent skin effects.

INHALATION:

Irritation of the nose and throat, dizziness, and headache.

INGESTION:

Depression of central nervous system can occur. Aspiration (breathing) into lungs, caused while vomiting, may result in severe pulmonary injury.

(See Section 11 for Toxicological Information)

4. FIRST AID MEASURES

EYES:

Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention.

SKIN:

Remove contaminated clothing. Wash skin with soap and plenty of water. Get medical attention if symptoms occur. Wash clothing before reuse.

INHALATION:

Remove to fresh air. If not breathing, give artificial respiration and seek medical attention immediately. Oxygen should only be administered by trained personnel.

INGESTION:

If swallowed, call a physician immediately. ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

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5. FIRE FIGHTING MEASURES

Flammable Properties

FLASH POINT / METHOD:
136 - 142 °F (58 - 61 °C) TAG CC

AUTOIGNITION TEMPERATURE:
555 °F (290 °C)

FLAMMABLE LIMITS IN AIR % BY VOLUME:
LOWER: Approximately 1.2
UPPER: Approximately 8.0

FIRE AND EXPLOSION HAZARD:
None expected. NFPA Class IIIA combustible liquid.

EXTINGUISHING MEDIA:
Water spray, fog or alcohol compatible foam is recommended.

FIRE FIGHTING INSTRUCTIONS:
Cool exposed equipment with water spray until well after fire is out. Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:
Evacuate the area and eliminate all sources of ignition. Contain the spill if possible. Dispose of only in accordance with local, state, and federal regulations.
Small Spills: Absorb with sand or other non-combustible absorbent material and place into containers for later disposal.
Large Spills: Dike far ahead of liquid spill for later disposal.

CERCLA HAZARDOUS SUBSTANCE:

Component	CERCLA RQ	Maximum Wt. %

Contains no chemicals on the CERCLA Hazardous Substance List.

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7. HANDLING AND STORAGE

ELECTROSTATIC ACCUMMULATION HAZARD:
Precautions should be taken to prevent electrostatic discharge.

USUAL SHIPPING CONTAINERS:
Tank cars, tank trucks, and drums.

STORAGE / TRANSPORT TEMPERATURE:
Hot water system recommended for temperature control when storage is at temperatures below melting point.

STORAGE / TRANSPORT PRESSURE:
Ambient

LOAD / UNLOAD TEMPERATURE:
Ambient

STORAGE AND HANDLING MATERIALS:
TANKS: Carbon steel with effective moisture control, carbon steel coated with baked phenolic, fiberglass reinforced plastic with epoxy or polyester resin, or metallic zinc in an inorganic binder.

NOTE: Any moisture may cause rusting of carbon steel. Product contamination may result.

SPECIAL PRECAUTIONS:
Inert gas blanket and breathing system needed to maintain color stability. Use dry inert gas having at least -40°F dew point.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Mechanical ventilation may be necessary if working with the product in enclosed areas or at elevated temperatures.

Personal Protective Equipment

EYES:
When contact with liquid is possible, use a face shield. Otherwise use safety glasses with side shields or goggles.

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SKIN:

Full protective clothing, chemical boots, and chemical gloves when contact with liquid is possible.

RESPIRATORY PROTECTION:

Respiratory protection is normally not required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Select the appropriate NIOSH-approved organic vapor air-purifying respirator, self-contained breathing apparatus, or air-supplied respirators in situations where there may be potential for overexposure.

Exposure Guidelines

Component	OSHA PEL	ACGIH TLV
None established.		

PEL = Permissible Exposure Limits
TLV = Threshold Limit Value
EL = Excursion Limit

TWA = Time Weighted Average (8 hr.)
STEL = Short Term Exposure Limit (15 min.)

Carcinogenicity

No carcinogenic ingredients.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:
Colorless liquid.

ODOR:
Sweet, pungent odor.

VAPOR PRESSURE (mm Hg.):
0.5 @ 70°F/21°C

VAPOR DENSITY (Air = 1):
4.5

SOLUBILITY IN WATER:
0.59 g/100g

VISCOSITY:
5.5 cSt @ 70°F/21°C

PHYSICAL STATE:
Liquid.

BOILING POINT:
313 - 316°F (156 - 158°C)

MELTING POINT:
-49°F (-45°C)

SPECIFIC GRAVITY ($H_2O = 1$):
0.820 @ 60/60°F

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10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:
High temperatures.

INCOMPATABILITY WITH OTHER MATERIALS:
Can react with strong oxidizers, inorganic acids, and halogens.

HAZARDOUS DECOMPOSITION PRODUCTS:
None expected.

HAZARDOUS POLYMERIZATION:
Should not occur.

11. TOXICOLOGICAL INFORMATION

EYES:

Primary Eye Irritation Index (Rabbits): 26.8 (unwashed), 32.6 (washed) at 24 hours; (Maximum score is 110). Irreversible corneal damage at day 3, the last day of observation.

SKIN:

Acute Dermal LD_{50} (Rabbits): 1.5 - 2.3 g/kg.
Primary Skin Irritation Index (Rabbits): 5.1 (Maximum score is 8.0).

INHALATION:
No deaths in rats after 1 hour at 21 mg/l.

INGESTION:
Acute Oral LD_{50} (Rat): 3.1 - 4.9 g/kg.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:
1-Hexanol toxicity to fathead minnows: 96h LC_{50} = 97.2 mg/l.

CHEMICAL FATE INFORMATION:
1-Hexanol is biodegradable (1.2 g O_2 uptake/g hexanol in 7 days in river water).

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13. DISPOSAL CONSIDERATIONS

SPECIAL INSTRUCTIONS:

Dispose of in accordance with local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.

WASTE CLASSIFICATION:

Liquids with a flash point below 140°F have the RCRA characteristic of ignitability, and are classed as hazardous for disposal purposes. This product should be evaluated at the time of disposal, since the product uses, transformations, and contamination that may occur during use may result in classification to a hazardous waste for reasons other than, and in addition to, ignitability.

EMPTY CONTAINERS:

Empty containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

(See Section 6 for CERCLA Reporting Requirements)

14. TRANSPORT INFORMATION

DOT DESCRIPTION:

This product is regulated as a hazardous material as defined by the Department of Transportation.

PROPER SHIPPING NAME: Hexanols
HAZARD CLASS: 3
IDENTIFICATION NUMBER: UN 2282
PACKING GROUP: III
ADDITIONAL INFORMATION: Flash Point = 136 - 142°F (58 - 61°C)

ICAO / IATA DESCRIPTION:

This product is regulated as a dangerous good as defined by IATA for air transportation.

PROPER SHIPPING NAME: Hexanols
HAZARD CLASS: 3
UN NUMBER: UN 2282
PACKING GROUP: III

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IMO DESCRIPTION (IMDG CODE):
This product is regulated as a dangerous good as defined by the IMDG Code for marine transport.

PROPER SHIPPING NAME: Hexanols
HAZARD CLASS: 3
UN NUMBER: UN 2282
PACKING GROUP: III

15. REGULATORY INFORMATION

U.S. Federal Regulations

OSHA HAZARD COMMUNICATION STANDARD CLASSIFICATION:
Combustible liquid, eye and skin irritant as defined by the OSHA Hazard Communication Standard.

TSCA INVENTORY LISTING:

Component	CAS Number
1-Hexanol	111-27-3

SARA 302 STATUS:

Component	CAS Number	Maximum Wt. %
Contains no chemicals subject to SARA 302 reporting.		

SARA 311/312 CLASSIFICATION:
SARA 311/312 "Immediate (acute) health hazard" and "Fire hazard".

SARA 313 CHEMICALS:

Component	CAS Number	Maximum Wt. %
Contains no chemicals subject to SARA 313 reporting.		

(See Section 6 for CERCLA Reporting Requirements.)

International Regulations

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) CLASSIFICATION:
Class B, Division 3: Combustible liquid.
Class D, Division 2, Subdivision B: Toxic material.

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CANADIAN DOMESTIC SUBSTANCE LIST (DSL) INVENTORY LISTING:

Chemical Name	CAS Number
1-Hexanol	111-27-3

EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS) LISTING:

Chemical Name	EINECS Number
1-Hexanol	2038523

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) INVENTORY LISTING:

Chemical Name	Section Structure #
Alkanol (C_{5-38})	2-237

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) LISTING:

Chemical Name	CAS Number
1-Hexanol	111-27-3

State Regulations

CALIFORNIA SAFE DRINKING WATER ACT (PROP 65) LISTING:

Component	CAS Number
No ingredients listed in this section	

Based on current analytical information, this product contains no detectable quantities of chemicals on the California Proposition 65 list.

16. OTHER INFORMATION

Hazard Ratings	NFPA	HMIS
HEALTH:	1	2
FLAMMABILITY:	2	2
REACTIVITY:	0	0

Revision Summary

Revised Sections 5 & 14.

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PREPARED BY: Sasol North America Inc. Safety, Health and Environmental Department
PHONE NUMBER: (281) 588-3491

Responsible Care®

010 05/13/05 ORTHOXYLENE

PRODUCT NAME: ORTHOXYLENE

MSDS NUMBER: P16191VS

DATE ISSUED: 01/10/2005

SUPERSEDES: 12/31/2001

ISSUED BY: 008562

****
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MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME(S) ORTHOXYLENE
CAS NUMBER 95-47-6
PRODUCT CODE ND

SYNONYM(S):
1,2-DIMETHYLBENZENE
O-DIMETHYLBENZENE
O-XYLENE
O-METHYLTOLUENE
1,2-XYLENE
O-XYLOL

MANUFACTURER/SUPPLIER:
Flint Hills Resources, LP, B.V., Pte Ltd. - Chemicals
2825 Suntide Road (78409)
P.O. Box 2608
Corpus Christi, TX 78403
TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE
Chemtrec 800-424-9300
Flint Hills Resources, LP 361-241-4811
TELEPHONE NUMBERS - GENERAL ASSISTANCE
8-5 (M-F, CST) 800-835-1121
8-5 (M-F, CST) MSDS 316-828-7988 Assistance

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Concentration*	Exposure Limits/ Health Hazards
ORTHOXYLENE	95-47-6	99 - 100 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
METAXYLENE	108-38-3	0 - 1 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
CUMENE	98-82-8	0 - 0.3 To	50 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)
PARAXYLENE	106-42-3	0 - 0.3 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
ETHYLBENZENE	100-41-4	0 - 0.1 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 125 ppm 15-Min STEL (ACGIH)
TOLUENE	108-88-3	0 - 0.1 %	200 ppm 8-Hour TWA (OSHA) 300 ppm CEILING (OSHA) 50 ppm 8-Hour TWA (ACGIH)
BENZENE	71-43-2	0 - 0.08 %	1 ppm 8-Hour TWA (OSHA) 5 ppm 15-Min STEL (OSHA)

				0.5 ppm 8-Hour TWA (ACGIH) 2.5 ppm 15-Min STEL (ACGIH)
1,3,5-TRIMETHYL-BENZENE	108-67-8	0 -	0.05 %	25 ppm 8-Hour TWA (ACGIH)
STYRENE	100-42-5	0 -	0.05 %	420 mg/m3 8-Hour TWA (OSHA) 85 mg/m3 8-Hour TWA (ACGIH)

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.
ND = No Data NA = Not Applicable

COMPOSITION COMMENTS

** Exposure to this chemical may add to the overall exposure, as it is readily absorbed through the skin.

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Flint Hills Resources, LP representative.

3 HAZARDS IDENTIFICATION EMERGENCY OVERVIEW WARNING!

HEALTH HAZARDS
MAY BE HARMFUL IF SWALLOWED
ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE MAY CAUSE CARDIAC SENSITIZATION
OVEREXPOSURE MAY CAUSE CNS DEPRESSION
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT POTENTIAL REPRODUCTIVE HAZARD
DANGER-CONTAINS BENZENE-CANCER HAZARD
SEE TOXICOLOGICAL INFORMATION (SECTION 11) FOR MORE INFORMATION

FLAMMABILITY HAZARDS FLAMMABLE
PER OSHA GUIDELINES, 29 CFR 1910.1200(c)

REACTIVITY HAZARDS
STABLE

POTENTIAL HEALTH EFFECTS, SKIN
SLIGHTLY TO MODERATELY IRRITATING. Contact may cause reddening, itching and inflammation.

Defatting agent. Repeated or prolonged contact may result in drying, reddening, itching, pain, inflammation, cracking and possible secondary infection with tissue damage.

No significant effects are expected to occur following short term exposure. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.

POTENTIAL HEALTH EFFECTS, EYE

MODERATELY TO SEVERELY IRRITATING. Direct contact may cause pain, tears, burns, sensitivity to light, swelling and possible corneal damage.

Exposure to vapors, fumes or mists may cause irritation.

Prolonged or repeated exposure may cause irritation and conjunctivitis.

POTENTIAL HEALTH EFFECTS, INHALATION

SLIGHTLY TOXIC. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. Symptoms may include sore throat, coughing, labored breathing, sneezing and burning sensation, depending on the concentration

and duration of exposure.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

May cause cardiac sensitization, including arrhythmia (irregular heart beat) and death due to cardiac arrest.

Overexposure to this material may cause systemic damage including target organ effects listed under Toxicological Information (Section 11).

Other specific symptoms of exposure are listed under Toxicological Information (Section 11).

POTENTIAL HEALTH EFFECTS, INGESTION

MODERATELY TOXIC. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under Inhalation (see Inhalation section).

Overexposure to this material may cause systemic damage including target organ effects listed under Toxicological Information (Section 11).

Other specific symptoms of exposure are listed under Toxicological Information (Section 11).

4 FIRST AID MEASURES

SKIN
Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE
Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION
Safely remove the victim from exposure. DO NOT ATTEMPT TO RESCUE WITHOUT ADEQUATE PROTECTIVE GEAR AND PROPER TRAINING. Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION
Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN
Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

In cases of acute poisoning, artificial respiration with administration of oxygen may be useful for support. DO NOT GIVE EPINEPHRINE, EPHEDRINE OR SIMILAR ADRENERGIC DRUGS. THEY MAY INDUCE FATAL VENTRICULAR FIBRILLATION. Electrocardiographic monitoring should be carried out with severely ill patients to anticipate possible cardiac arrest.

Anemia may require the usual supportive measures. Medical evaluation of acute overexposure should include hematological determinations until stable. In severe acute and chronic poisoning, both renal and hepatic damage may occur and should be anticipated in such cases. Respiratory and pulmonary problems may require special attention. After severe acute symptoms have been alleviated, it may be advisable to consider periodic monitoring of the patient until such time as the likelihood of other adverse effects can be discounted.

5 FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

Combustion may produce hazardous combustion products such as COx, NOx, and SOx.

EXTINGUISHING MEDIA

Use water spray, dry chemical, carbon dioxide or fire-fighting foam for Class B fires to extinguish fire.

BASIC FIRE FIGHTING PROCEDURES

Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors can travel to a source of ignition and flash back.

Explosion hazard if exposed to extreme heat.

Flash Point 85 deg F (29 deg C) TAG CLOSED CUP
Autoignition Temperature 869 deg F (465 deg C)
Flammability Limits in Air, Lower, % by Volume 1 %
Flammability Limits in Air, Upper, % by Volume 6 0/0 6

6. ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 800 meters (1/2 mile) in all directions if tank, rail car or tank truck is involved in fire. Evacuate area endangered by release as required. (See Exposure Controls/Personal Protection, Section 8.)

ENVIRONMENTAL PRECAUTIONS

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If material is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released material. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep unnecessary people away. Isolate area for at least 50 to 100 meters (160 to 330 feet) to preserve public safety. For large spills, consider initial evacuation for at least 300 meters (1000 feet).

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal.

Use a vapor suppressing foam to reduce vapors. Stop leak when safe to do so. See Exposure Controls/Personal Protection (Section 8).

7 HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE
Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain material residue. Do not reuse without adequate precautions. Do not eat, drink or smoke in areas of use or storage.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)
Keep away from eyes. Eye contact can be avoided by using chemical safety glasses, goggles, and/or face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)
Avoid skin contact with this material. Use appropriate chemical protective gloves when handling. Additional protective clothing may be necessary.

Good personal hygiene practices such as properly handling contaminated clothing, using wash facilities before entering public areas and restricting

eating, drinking and smoking to designated areas are essential for preventing personal chemical contamination.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)
A NIOSH approved air purifying respirator with an appropriate cartridge or canister, such as an organic vapor cartridge, may be used in circumstances where airborne concentrations may exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

9 PHYSICAL & CHEMICAL PROPERTIES ODOR AND APPEARANCE

CLEAR, COLORLESS LIQUID WITH A MODERATE, AROMATIC ODOR

Boiling Point 292 deg F (144 deg C)
Specific Gravity 0.88 at 60/60 deg F (15.6/15.6 deg C)
Melting Point -12 deg F (-24 deg C)
Percent Volatile 100 %
Vapor Pressure 7 mmHg at 68 deg F (20 deg C)
Vapor Density 3.7
Bulk Density ND
Solubility in Water NEGLIGIBLE
Octanol/Water Partn ND
Volatile Organic ND
Pour Point ND
pH Value ESSENTIALLY NEUTRAL
Freezing Point ND
Viscosity ND
Evaporation Rate SLOW RATE
Molecular Formula C8H10
Molecular Weight 106.1600
Chemical Family AROMATIC HYDROCARBON
Odor Threshold ND

10 STABILITY & REACTIVITY

STABILITY/INCOMPATIBILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce COx, NOx, SOx, and other decomposition products in the case of incomplete combustion.

11 TOXICOLOGICAL INFORMATION

ROUTES OF EXPOSURE
Inhalation, ingestion, skin and eye contact.

LD50
LD50 - (rat) 3523-4400 mg/kg

LC50
LC50 - (rat) 4740-6700 ppm

TOXICOLOGICAL DATA

Exposure to this material or its components may cause the following specific symptoms, depending on the concentration and duration of exposure: ringing in the ears, hearing loss, corneal vacuoles, paresthesia, vertigo, decreased peripheral nerve function, mucosal bleeding, enlarged liver and anemia.

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: skin, blood elements, liver, kidney, cardiovascular, nervous and respiratory system.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this material may be harmful or fatal.

This material may contain benzene. Acute benzene poisoning causes central nervous system depression. Chronic exposure affects the hematopoietic system causing blood disorders including anemia and pancytopenia.

CARCINOGENICITY

This material may contain benzene. Benzene is carcinogenic to laboratory animals when given by intubation or by inhalation. There is an association between occupational exposure to benzene and human leukemia. Carcinogenic determinations: IARC human positive and animal suspected carcinogen (IARC Class 1); NTP known carcinogen; ACGIH suspected carcinogen; OSHA carcinogen.

This material may contain ethylbenzene. IARC has determined that there is sufficient evidence for the carcinogenicity of ethylbenzene in experimental animals and inadequate evidence for the carcinogenicity of ethylbenzene in humans. (IARC Class 2B)

TERATOGENICITY, MUTAGENICITY, OTHER REPRODUCTIVE EFFECTS

This material contains xylenes which may cause adverse reproductive and/or developmental effects. These effects appear to occur at doses that are maternally toxic.

This material may contain benzene. Mutagenic and clastogenic in mammalian and non-mammalian test systems. Reproductive or developmental toxicant only at doses that are maternally toxic, based on tests with animals.

Pregnant women may be at an increased risk from exposure.

Consumption of alcoholic beverages may enhance toxic effects.

PRE-EXISTING CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, liver, kidney, blood, respiratory, cardiovascular and nervous system.

SYNERGISTIC MATERIALS
ND

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

This material contains orthoxylene which biodegrades in soil and water and oxidizes in air. This material is not expected to bioaccumulate in aquatic organisms.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This material, as supplied, when discarded or disposed of, is a U239 listed hazardous waste according to Federal Regulations 40 CFR 261.33(f) due to its ignitability, and a characteristic hazardous waste due to its ignitability and benzene content as defined in Subpart C of 40 CFR 261. Additionally, pursuant to 40 CFR 261.33(d) and (e), any residue remaining in a container

that has held this material and any residue or contaminated soil, water or other debris resulting from the cleanup of a spill of this material is also a listed hazardous waste. Under RCRA, it is the responsibility of the user of the material to determine, at the time of disposal, whether the material meets RCRA criteria for hazardous waste.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)
Xylenes, (Orthoxylene), 3, UN1307, PG III, RQ

BILL OF LADING - NON-BULK (U. S. DOT)
Xylenes, (Orthoxylene), 3, UN1307, PG III

U. S. Department of Transportation (DOT) Requirements

General Transportation Information for Bulk Shipments

Proper Shipping Name Xylenes, (Orthoxylene)
Hazard Class 3 UN/NA Code UN1307
Packaging Group PG III
Labels Required Flammable Liquid
Placards Required Flammable Liquid, UN1307
Reportable Quantity See Regulatory Information (Section 15)

General Transportation Information for Non-Bulk Shipments
Proper Shipping Name Xylenes, (Orthoxylene)
Hazard Class 3 UN/NA Code UN1307
Packaging Group PG III
Labels Required Flammable Liquid
Placards Required Flammable Liquid, UN1307
Reportable Quantity See Regulatory Information (Section 15)

COMMENTS
The above description may not cover shipping in all cases, please consult 49 CFR 100-185 for specific shipping information.

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

All ingredients are on the TSCA inventory, or are not required to be listed on the TSCA inventory.

Consult OSHA's Benzene standard 29 CFR 1910.1028 for provisions on air monitoring, employee training, medical monitoring, etc.

This material may be subject to export notification under TSCA section 12(b); contains: Paraxylene (CAS # 106-42-3) Effective Date 5/26/04.

This material, as supplied, contains benzene, paraxylene, styrene, orthoxylene, metaxylene, toluene, ethylbenzene, and cumene, which are CERCLA Hazardous Substances as per 40 CFR Part 302.4, and is therefore subject to the release reporting requirements of CERCLA. The reportable quantities for benzene, paraxylene, styrene, orthoxylene, metaxylene, toluene, ethylbenzene, and cumene, are 10, 100, 1000, 1000, 1000, 1000, 1000, and

5000 pound(s), respectively.

This material contains toxic chemical(s) in excess of the applicable de minimis concentration that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372). This information must be included in all MSDSs that are copied and distributed for this material.

This material contains up to 100% volatile organic compounds (VOCs) per 40 CFR Part 51.100. This material contains up to 100% hazardous air pollutants (HAPs) per Section 112 Clean Air Act Amendments of 1990.

Check local, regional or state/provincial regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

STATE REGULATIONS

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

This material, as sold, meets the requirements of the Model Toxics Legislation of the Coalition of Northeastern Governors (CONEG). Any alteration of this material may affect its compliance with this law.

SARA 311/312 HAZARD CATEGORIES

Immediate Hazard: X Delayed Hazard: X Fire Hazard: X Pressure Hazard: Reactivity Hazard:

NFPA RATINGS
Health 2 Flammability 3 Reactivity 0 Special Hazards

HMIS RATINGS
Health 2* Flammability 3 Reactivity 0

Following ingredients of this material are listed in SARA 313 above the de minimis concentration

SARA Listed Ingredient Name	CAS Number	Maximum %
ORTHOXYLENE	95-47-6	100.0
METAXYLENE	108-38-3	1.0

---------- FOR ADDITIONAL INFORMATION ----------
CONTACT: MSDS COORDINATOR UNIVAR USA INC.
DURING BUSINESS HOURS, PACIFIC TIME (425)889-3400
---------- NOTICE ----------

********** UNIVAR USA INC ("UNIVAR") EXPRESSLY DISCLAIMS

ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A

PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN,

AND SHALL UNDER NO CIRCUMSTANCES BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

DO NOT USE INGREDIENT INFORMATION AND/OR INGREDIENT PERCENTAGES IN THIS MSDS AS A PRODUCT SPECIFICATION. FOR PRODUCT SPECIFICATION INFORMATION REFER TO A

PRODUCT SPECIFICATION SHEET AND/OR A CERTIFICATE OF ANALYSIS. THESE CAN BE OBTAINED FROM YOUR LOCAL UNIVAR SALES OFFICE.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, UNIVAR MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND UNIVARS CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON , INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

* * * E N D O F M S D S * * *

RESPONSE TO ALLEGED NOVs & IRLs

ATTACHMENT 15

Copies of RCRA Waste Analyses for Select Waste Streams

Elan Chemical Company, Inc.
Newark, NJ

EMP6 - Aldehyde C-16 residue

CHEMTECH

LABORATORY REPORT

REPORT OF ANALYSES

ELAN CHEMICAL
268 DOREMUS AVENUE
NEWARK, NJ 07105-
Attn: JOCELYN MANSHIP

DATE: 03/12/99
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

SAMPLE				DELIVERY TO LAB		
LAB No.	DATE	TIME	SAMPLER	DATE	TIME	MATRIX
67461	02/23/99	0900	CLIENT	02/23/99	1130	SO

CLIENT STATION ID: EM4677
LAB #: 67461

TCLP EXTRACTION (METALS/BNA)		COMPLETE
TCLP SEMI-VOA'S.....		R. A.
TCLP VOA'S.....		R. A.
TCLP ARSENIC	mg/L	<0.004
TCLP LEAD	mg/L	0.002
TCLP BARIUM	mg/L	0.002
TCLP CADMIUM	mg/L	<0.0014
TCLP MERCURY	mg/L	< 0.0002
TCLP SELENIUM	mg/L	0.010
TCLP SILVER	mg/L	<0.002
TCLP CHROMIUM	mg/L	<0.002
IGNITIBILITY	Degree C	>100
CORROSIVITY	pH Unit	9.20
SULFIDE-REACTIVITY	mg/kg	< 53.0
CYANIDE-REACTIVITY	mg/Kg	<1.05
SOLIDS, PERCENT	%	97.88

The residue sample is below regulatory levels for the Toxicity Characteristic Leaching Procedure tsest for determination of hazardous waste status.

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR _____

110 Route 4
Englewood, New Jersey 07631
Phone: (201) 567-6868 Fax: (201) 567-1333

515 Route 9
Barnegat, New Jersey 08005
Phone: (609) 693-2111 Fax: (609) 698-0910

NYSDOH Certification No. 10624
NJDEP Certification No. 15004

CHEMTECH

LABORATORY REPORT

2/23/99
EMP6 Residue

REPORT OF ANALYSES

ELAN CHEMICAL
268 DOREMUS AVENUE
NEWARK, NJ 07105-
Attn: JOCELYN MANSHIP

DATE: 03/12/99
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

LAB No.	SAMPLE DATE	SAMPLE TIME	SAMPLER	DELIVERY TO LAB DATE	DELIVERY TO LAB TIME	MATRIX
67461	02/23/99	0900	CLIENT	02/23/99	1130	SO

CLIENT STATION ID: EM4677
LAB #: 67461

TCLP EXTRACTION (METALS/BNA)		COMPLETE
TCLP SEMI-VOA'S.....		R. A.
TCLP VOA'S.....		R. A.
TCLP ARSENIC	mg/L	<0.004
TCLP LEAD	mg/L	0.002
TCLP BARIUM	mg/L	0.002
TCLP CADMIUM	mg/L	<0.0014
TCLP MERCURY	mg/L	< 0.0002
TCLP SELENIUM	mg/L	0.010
TCLP SILVER	mg/L	<0.002
TCLP CHROMIUM	mg/L	<0.002
IGNITIBILITY	Degree C	>100
CORROSIVITY	pH Unit	9.20
SULFIDE-REACTIVITY	mg/kg	< 53.0
CYANIDE-REACTIVITY	mg/Kg	<1.05
SOLIDS, PERCENT	%	97.88

The residue sample is below regulatory levels for the Toxicity Characteristic Leaching Procedure tsest for determination of hazardous waste status.

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR

110 Route 4
Englewood, New Jersey 07631
Phone: (201) 567-6868 Fax: (201) 567-1333

515 Route 9
Barnegat, New Jersey 08005
Phone: (609) 698-2111 Fax: (609) 698-0910

NYSDOH Certification No. 10624
NJDEP Certification No. 02548

NJDEP Certification No. 15004

CHEMTECH

LABORATORY REPORT

REPORT OF ANALYSES

ELAN CHEMICAL
268 DOREMUS AVENUE
NEWARK, NJ 07105-
Attn: JOCELYN MANSHIP

DATE: 03/10/99
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

LAB No.	SAMPLE DATE	SAMPLE TIME	SAMPLER	DELIVERY TO LAB DATE	DELIVERY TO LAB TIME	MATRIX
67461	02/23/99	0900	CLIENT	02/23/99	1130	SO

CLIENT STATION ID: EM4677
LAB #: 67461

TCLP EXTRACTION (METALS/BNA)		COMPLETE
TCLP SEMI-VOA'S.....		R. A.
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TCLP ARSENIC	mg/L	<0.004
TCLP LEAD	mg/L	0.002
TCLP BARIUM	mg/L	0.002
TCLP CADMIUM	mg/L	<0.0014
TCLP MERCURY	mg/L	< 0.0002
TCLP SELENIUM	mg/L	0.010
TCLP SILVER	mg/L	<0.002
TCLP CHROMIUM	mg/L	<0.002
IGNITIBILITY	Degree C	>100
CORROSIVITY	pH Unit	9.20
SULFIDE-REACTIVITY	mg/kg	< 53.0
CYANIDE-REACTIVITY	mg/Kg	<1.05
SOLIDS, PERCENT	%	97.88

PROJECT NAME: EM4677

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR _____

110 Route 4
Englewood, New Jersey 07631
Phone: (201) 567-6868 Fax: (201) 567-1333

515 Route 9
Barnegat, New Jersey 08005
Phone: (609) 693-2111 Fax: (609) 698-0910

NYSDOH Certification No. 10624
NJDEP Certification No. 02548

NJDEP Certification No. 15004

1A

TCLP VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

EM4677

Lab Name: CHEMTECH Contract: ELAN CHEMICAL

Project No.: 10855C Site: _____ Location: _____ Group: _____

Matrix: (soil/water) WATER Lab Sample ID: O67461

Sample wt/vol: 1.0 (g/mL) ML Lab File ID: V5380.D

Level: (low/med) _____ Date Received: 2/23/99

% Moisture: not dec. 100 Date Analyzed: 2/25/99

GC Column: RTX624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS No.	Compound	Concentration Units: (ug/L or ug/Kg) ug/L	Q
75-01-4	Vinyl Chloride	50	U
75-35-4	1,1-Dichloroethene	50	U
67-66-3	Chloroform	50	U
107-06-2	1,2-Dichloroethane	50	U
78-93-3	2-Butanone	50	U
56-23-5	Carbon Tetrachloride	50	U
79-01-6	Trichloroethene	14	
71-43-2	Benzene	14	
127-18-4	Tetrachloroethene	50	U
108-90-7	Chlorobenzene	50	U

1B

SAMPLE NO.

EM4677

TCLP SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: CHEMTECH Contract: ELAN CHEMICAL

Project No.: 10855C Site: Location: Group: EM4677

Matrix: (soil/water) WATER Lab Sample ID: O67461

Sample wt/vol: 100.0 (g/mL ML Lab File ID: Z03572.D

Level: (low/med) Date Received: 2/23/99

% Moisture: 100 decanted: (Y/N): N Date Extracted: 2/25/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 2/26/99

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS No.	Compound	Concentration Units: (ug/L or ug/Kg) ug/L	Q
110-86-1	Pyridine	100	U
106-46-7	1,4-Dichlorobenzene	100	U
95-48-7	2-Methylphenol	100	U
106-44-5	3+4-Methyphenols	200	U
67-72-1	Hexachloroethane	100	U
98-95-3	Nitrobenzene	100	U
87-68-3	Hexachlorobutadiene	100	U
88-06-2	2,4,6-Trichlorophenol	100	U
95-95-4	2,4,5-Trichlorophenol	250	U
121-14-2	2,4-Dinitrotoluene	100	U
118-74-1	Hexachlorobenzene	100	U
87-86-5	Pentachlorophenol	250	U

CHEMTECH

CHAIN OF CUSTODY RECORD

North Jersey ☐
110 Route 4
Englewood, NJ 07631
(201) 567-6868 Fax (201) 567-1333

South Jersey ☐
512 Route 9 South
Forked River, NJ 08731
(609) 693-2111 Fax (609) 971-9300

CHEMTECH JOB NO.:

CHEMTECH QUOTE NO.:

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: ELAN Chemical

ADDRESS: 268 Doremus Ave

CITY: Newark STATE: NJ ZIP: 07105

ATTENTION: Jocelyn KAPPMANSHIP

PHONE: 973 344 8014 FAX: 973 344 1948

PROJECT INFORMATION

PROJECT NAME: EM4677

PROJECT NO.: +

PROJECT MANAGER:

LOCATION:

PHONE: FAX:

BILLING INFORMATION

BILL TO: ELAN Chem PO #: 22457

ADDRESS: 268 Doremus Ave

CITY: Newark STATE: NJ ZIP: 07105

ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

☐ 21 DAYS _____ APPROVED BY:
☐ 14 DAYS _____
☐ 7 DAYS _____
☐ OTHER _____

21 DAY TURNAROUND HARDCOPY, EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED.

DATA DELIVERABLE INFORMATION

☐ NJ REDUCED ☐ CHEMTECH FORMAT
☐ NJ CLP ☐ RESULTS ONLY
☐ USEPA CLP ☐ DISKETTES
☐ NYS CLP ☐ NYS ASP
☐ OTHER _____

ANALYSIS

1 TCLP/VOA
2 TCLP BNA Metals
3 I, Cl, Cr, Reactivity
4
5
6 BOD/TSS
7
8
9

PRESERVATIVES

COMMENTS

A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other
← Specify Preservatives

CHEMTECH SAMPLE ID	SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9
1.	EM4677		X		2/23	9AM	2	1	1							
2.	M175		X		2/23	8AM	1					X				
3.																
4.																
5.																
6.																
7.																
8.																

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	2/23 9AM	1. [signature]
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 2/23/99	RECEIVED FOR LAB BY: 3. [signature]

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non-Compliant ☐ Temp. of Cooler 5°C.

Comments:

WHITE – CHEMTECH COPY FOR RETURN TO CLIENT YELLOW – CHEMTECH COPY PINK – SAMPLER COPY

№ 020724

CHEMTECH

DATA REPORTING QUALIFIERS - ORGANIC

For reporting results, the following "Results Qualifiers" are used:

VALUE - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates the compound was analyzed for, but was not detected. Report the minimum detection limit for the sample with the U, ie "10 U". This is not necessarily the instrument detection limit. The figure represents the minimum detection limit attainable for this particular sample based on any concentration or dilution that may have been required.

J - Indicates an estimated value. This flag is used:

(1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed).

(2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit but greater than zero. If the detection limit was 10 ug/L and a concentration of 3 ug/L was calculated, report as "3 J".

B - Indicates the analyte was found in the blank as well as the sample; report as "12 B".

E - Indicates the analyte's's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

P - This flag is used for a Pesticide/Aroclor target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".

N - This flag indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.

W.A.T.E.R. WORKS LABORATORY INC.
364 Glenwood Ave., East Orange, NJ 07017
(973) 678-3787 FAX (973) 678-8779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A
SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: NAT RSTD CASSIA OIL
SAMPLE NUMBER: 182000

PARAMETER	MDL	RESULTS
REACTIVE CYANIDE	2.0	ND
REACTIVE SULFIDE	1.5	6
FLASHPOINT Deg F		>180

All Results Reported As ppm
MDL = Method Detection Limit
ND = Not Detected Above MDL

W.A.T.E.R. WORKS LABORATORY INC.
364 Glenwood Ave., East Orange, NJ 07017
(973) 678-3787 FAX (973) 678-6779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A
SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: 1,2 HEXANE DIUL
SAMPLE NUMBER: 182001

PARAMETER	MDL	RESULTS
REACTIVE CYANIDE	2.0	ND
REACTIVE SULFIDE	1.5	8
FLASHPOINT Deg F		>180

All Results Reported As ppm
MDL = Method Detection Limit
ND = Not Detected Above MDL

W.A.T.E.R. WORKS LABORATORY INC.
364 Glenwood Ave., East Orange, NJ 07017
(973) 678-3787 FAX (973) 678-6779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A
SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: ETHYL CINNAMATE
SAMPLE NUMBER: 182002

PARAMETER	MDL	RESULTS
REACTIVE CYANIDE	2.0	ND
REACTIVE SULFIDE	1.5	6
FLASHPOINT Deg F		>180

All Results Reported As ppm
MDL = Method Detection Limit
ND = Not Detected Above MDL

268 DOREMUS AVENUE
NEWARK, NJ 07105
(973) 344-8014
FAX (973) 344-1948
www.elan-chemical.com
EMAIL sales@elan-chemical.com

July 18, 2006

pH Analysis of Compound SB

1,2 Hexanediol residue	7.65
NRCO residue	9.40

Robert Fiscina
Quality Control Manager

elan
268 DOREMUS AVENUE
NEWARK, NJ 07105
(973) 344-8014
FAX (973) 344-1948
www.elan-chemical.com
EMAIL sales@elan-chemical.com

St. James Hospital
219 Chestnut Street
Newark, NJ 07105
973-589-1300

5/7/07

Dear Sir or Madam,

As required by RCRA (Resource Conservation and Recovery Act) under statute 40CFR265.37, Elan Chemical is providing you with a copy of our Contingency and Emergency Plan. This plan details the procedures by which we will operate should an emergency involving our plant or personnel occur. In such a case, we hope that this precaution of providing you with this information will help to ensure the safety of all involved.

Regards,

Ramona Kistler
Compliance Manager

State of New Jersey
Department of Environmental Protection
Hazardous Waste Regulation Program
Manifest Section
P.O. Box 414, Trenton, NJ 08625-0414

4108579

Please type or print in block letters. (Form designed for use on elite (12-pitch) typewriter.) *Form Approved.* *OMB No. 2050-0039.*

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. [illegible] Manifest Document No. 1	2. Page 1 of — Information in the shaded areas is not required by Federal law.
3. Generator's Name and Mailing Address: Elan Chemical Co. 268 DOREMUS AVE., NEWARK, NJ 07105 973-344-8014	4. Generator's Phone ( )	A. State Manifest Document Number: NJA 4108579 B. State Generator's ID (Gen. Site Address): SAME
5. Transporter 1 Company Name: Hazmat Environmental Group	6. US EPA ID Number: NYD980769947	C. State Trans. ID-NJDEP: 00602 Decal No. - [illegible] D. Transporter's Phone (716-827-7200
7. Transporter 2 Company Name	8. US EPA ID Number	E. State Trans. ID-NJDEP Decal No. - F. Transporter's Phone ( )
9. Designated Facility Name and Site Address: GIANT RESOURCE RECOVERY INC RT. 1, STATE RD 652 ARVONIA, VA 23004	10. US EPA ID Number: VAD098443443	G. State Facility's ID: VAD098443443 H. Facility's Phone (434-581-3228

	HM	11. US DOT Description (Including Proper Shipping Name, Hazard Class or Division, ID Number and Packing Group)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	X	RQ Waste Flammable Liquid, N.O.S., 3, UN1993, PGII (METHANOL, ETHANOL) D001,F003,F005	001	TT	X[illegible]	G	F003 F005
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above		K. Handling Codes for Wastes Listed Above	
a. PROFILE #0423 MIXED SOLVENTS FRAGRANCES L/I	c.	a.	c.
b.	d.	b.	d.

15. Special Handling Instructions and Additional Information
STATE OF ORIGIN - NJ
EMERGENCY PHONE - (800) 424-9300
GUIDE BOOK ID 128

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
LEN ARMENT.	[signature]	09 28 03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
GILBERT BRANCH	Gilbert Branch	09 29 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year

GENERATOR / TRANSPORTER / FACILITY

In case of an emergency or spill immediately call the state the emergency occurred in and the N.J. Dept. of Environmental Protection. (609) 292-7172

NJA 4108579

EPA Form 8700-22

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

Land Disposal Restriction Notification

GENERATOR NAME: ELAN CHEMICAL CITY/STATE: NEWARK, NJ

GENERATOR EPA ID NUMBER: NJD042895680 MANIFEST DOCUMENT NUMBER: 08579

This form is submitted in accordance with the regulations published by EPA in 40 CFR 268, which govern the land disposal of certain untreated hazardous wastes. I have indicated how my waste must be managed to conform with land disposal restrictions.

INSTRUCTIONS: Indicate the applicable hazardous constituents and their treatment standards by checking the appropiate box in the Wastewater or Non-Wastewater column. For restricted waste codes not pre-printed, such as additional D, F, P, U, and K codes, write in the waste code; description, subcategory or constituent and treatment standard listed in 40 CFR 268.40. If D018-D043 apply, also list all Underlying Hazardous Constituents as defined by 40 CFR 268.2 and their associated Universal Treatment Standards listed in 40 CFR 268.48.

NOTE: If the waste is hazardous debris as defined by 40 CFR 268.2, a different form must be used which can be obtained from the TSDF.

EPA Waste Code and Description, Treatment Subcategory, or Constituent	✓	Non-Wastewater Treatment Standard	✓	Wastewater Treatment Standard
D001 - High TOC Ignitable Liquids ≥10% TOC	X	RORGS, CMBST		N/A
D004 - Arsenic		5.0 mg/l TCLP		5.0 mg/l
D005 - Barium		100.0 mg/l TCLP		100.0 mg/l
D006 - Cadmium		1.0 mg/l TCLP		1.0 mg/l
D007 - Chromium		5.0 mg/l TCLP		5.0 mg/l
D008 - Lead		5.0 mg/l TCLP		5.0 mg/l
D009 - Mercury (Low Mercury Subcategory <260 mg/kg)		0.2 mg/l TCLP		0.2 mg/l
D010 - Selenium		5.7 mg/l TCLP		1.0 mg/l
D011 - Silver		5.0 mg/l TCLP		5.0 mg/l

Additional Waste Codes and Underlying Hazardous Constituents (UHC's apply to D018-D043 only)

I am the generator of an untreated waste identified on this form which must be treated to the appropriate treatment standards set forth in 40 CFR 268. This information is based upon either generator knowledge of the waste stream or an analysis of the waste.

Signature: [signature] Title: MGR Date: 9/29/03

(Indisc.frm)

(F001-F005) Spent Solvent Wastes Treatment Standards

INSTRUCTIONS: Indicate all "F" solvent constituents present in the waste by checking the appropriate box in the Wastewater/Wastewater column. At least one constituent should be checked for each waste code that appears on the manifest.

Waste Codes: F003, F005

WASTE CODE	CONSTITUENT	✓	Non-Wastewater Treatment Standard	✓	Wastewater Treatment Standard
F001	Carbon tetrachloride		6.0 mg/kg		0.057 mg/l
	Methylene chloride		30 mg/kg		0.089 mg/l
	Tetrachloroethylene		6.0 mg/kg		0.056 mg/l
	1,1,1-Trichloroethane		6.0 mg/kg		0.054 mg/l
	Trichloroethylene		6.0 mg/kg		0.054 mg/l
	1,1,2-Trichloro-1,2,2-trifluoroethane		30 mg/kg		0.057 mg/l
	Trichloromonofluoro-methane		30 mg/kg		0.020 mg/l
F002	Chlorobenzene		6.0 mg/kg		0.057 mg/l
	o-Dichlorobenzene		6.0 mg/kg		0.088 mg/l
	Methylene chloride		30 mg/kg		0.089 mg/l
	Tetrachloroethylene		6.0 mg/kg		0.056 mg/l
	1,1,1-Trichloroethane		6.0 mg/kg		0.054 mg/l
	1,1,2-Trichloroethane		6.0 mg/kg		0.054 mg/l
	Trichloroethylene		6.0 mg/kg		0.054 mg/l
	1,1,2-Trichloro-1,2,2-trifluoroethane		30 mg/kg		0.057 mg/l
	Trichloromonofluoro-methane		30 mg/kg		0.020 mg/l
F003	Acetone		160 mg/kg		0.28 mg/l
	n-Butyl alcohol		2.6 mg/kg		5.6 mg/l
	Cyclohexanone		0.75 mg/l TCLP*		0.28 mg/l
	Ethyl acetate		33 mg/kg		0.34 mg/l
	Ethyl benzene		10 mg/kg		0.057 mg/l
	Ethyl ether		160 mg/kg		0.12 mg/l
	Methanol	X	0.75 mg/l TCLP*		5.6 mg/l
	Methyl isobutyl ketone		33 mg/kg		0.14 mg/l
	Xylenes	X	30 mg/kg		0.32 mg/l
F004	Cresol (m and p isomers)		5.6 mg/kg		0.77 mg/l
	o-Cresol		5.6 mg/kg		0.11 mg/l
	Nitrobenzene		14 mg/kg		0.068 mg/l
F005	Benzene		10 mg/kg		0.14 mg/l
	Carbon disulfide		4.8 mg/l TCLP*		3.8 mg/l
	2-Ethoxyethanol		INCN**		BIOD, INCN**
	Isobutyl Alcohol		170 mg/kg		5.6 mg/l
	Methyl ethyl ketone		36 mg/kg		0.28 mg/l
	2-Nitropropane		INCN**		(WTOX or CHOX) & CARBN or INCN**
	Pyridine		16 mg/kg		0.014 mg/l
	Toluene	X	10 mg/kg		0.080 mg/l

* Treatment Standard only applies if 1 or more of these constituents and no other F001-F005 constituents are present in the waste.

** Treatment Standard applies if this is the only regulated constituent present in the waste.

California Use Treatment Standards

INSTRUCTIONS: Place check next to appropriate categories and corresponding treatment standards.

Criteria

_ PCB's > 50 ppm

_ Nickel > 134 mg/l (liquid waste)

_ Thallium > 130 mg/l (liquid waste)

_ Liquid or soil hazardous waste containing halogenated organic compounds (HOC's) listed in 40 CFR 264.32 Appendix III in HOC concentration ≥ 1000 mg/kg or 1000 mg/l

Standard

Incineration

Removal of compounds and/or solidification to case RFT

Removal of compounds and/or solidification to case RFT

Incineration

CERTIFICATE OF DISPOSAL

NAME AND ADDRESS OF GENERATOR

COMPANY: ELAN CHEMICAL CO

ATTENTION: BEN ARMENTI

ADDRESS: 288 DOREMUS AVENUE

NEWARK, NJ 07105

MANIFEST #: NJA 4108579

GENERATOR EPA ID NUMBER: NJD042895680

This documents that the following waste material(s) was removed from your facility on 9/29/03. This description is based solely on the information supplied by you on the manifest for this specific shipment.

This waste consisted of:

Quantity:

RQ,Waste Flammable Liquid,NOS

3, UN1993:PGII(Methanol,Ethanol)

4,996

Material(s) was transported by:

COMPANY: HAZMAT ENVIRONMENTAL GP

EPA ID #: NYD980769947

ADDRESS: 60 COMMERCE DRIVE

BUFFALO, NY 14218

Material(s) was managed at:

COMPANY: GIANT RESOURCE RECOVERY

EPA ID #: VAD098443443

ADDRESS: ST.RT. 652, P.O. BOX 68

ARVONIA, VA 23004

The above material was managed in accordance with all current and applicable Federal and State Regulations based on the description and identification of the material on the manifest. The generator is responsible for any unauthorized transportation and/or disposal resulting from improper or inaccurate description or identification of the material.

Sincerely,

GIANT RESOURCE RECOVERY

MANIFEST COORDINATOR

266 DOREMUS AVENUE
NEWARK, NJ 07105
(973) 344-8014
FAX (973) 344-1948
www.elan-chemical.com
EMAIL sales@elan-chemical.com

Newark Police Department
311 Washington Street
Newark, NJ 07102
973-733-6190

5/7/07

Dear Sir or Madam,

As required by RCRA (Resource Conservation and Recovery Act) under statute 40CFR265.37, Elan Chemical is providing you with a copy of our Contingency and Emergency Plan. This plan details the procedures by which we will operate should an emergency involving our plant or personnel occur. In such a case, we hope that this precaution of providing you with this information will help to ensure the safety of all involved.

Regards,

Ramona Kistler
Compliance Manager

ACRA's File

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

AUG - 9 2006

CERTIFIED MAIL-RETURN RECEIPT REQUESTED
Article number: 7003 2260 0000 3248 3925

Mr. Michael Deyo, Environmental Manager
Giant Resource Recovery
1500 Forrest Avenue, Suite 201
Richmond, VA 23229

Re: RCRA § 3007 Information Request — RCB ID# 06-3007-0000-156
Giant Resource Recovery
EPA ID#:VAD098443443

Dear Mr. Deyo:

The U.S. Environmental Protection Agency (EPA) is charged with the protection of health and the environment under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Part 6901 et seq.

Pursuant to the provisions of Section 3007 of RCRA, 42 U.S.C. Section 6927, EPA hereby requires that you provide the information requested in Attachment I to this letter using the instructions and definitions included in Attachment II. This information is required to evaluate the compliance of Elan Chemical Inc., located at 268 Doremus Avenue, Newark, NJ 07105. Elan's EPA ID Number is NJD042895680.

Please provide the information requested no later than thirty (30) calendar days from receipt of this letter. Requests for additional time must be made within ten (10) calendar days of receipt of this letter, and must be justified. The response must be signed by a responsible official or agent of your company.

The response to the request in the attachment must be mailed to:

Abdool Jabar
Environmental Engineer
RCRA Compliance Branch
U.S. Environmental Protection
Agency - Region II

290 Broadway, 22nd Floor
New York, New York 10007-1866

You may, if you so desire, assert a business confidentiality claim covering all or part of the information herein requested. The claim may be asserted by placing on (or attaching to) the information at the time it is submitted, a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as "trade secret", "proprietary", or "company confidential". The claim should set forth the information requested in 40 Code of Federal Regulations (40 C.F.R.) Part 2.204(e)(4). Information covered by such a claim will be disclosed by EPA only to the extent permitted by, and by means of procedures set forth in, 40 C.F.R. Part 2. If no such claim accompanies the information when it is received by EPA, it may be made available to the public by EPA without further notice to you.

This information request is not subject to the requirements of the Paperwork Reduction Act of 1980, 44 U.S.C. Part 3501 et seq.

Failure to respond in full to this requirement is a violation of RCRA and may result in federal enforcement action pursuant to Section 3008 of RCRA, 42 U.S.C. Section 6928.

If you have any questions about this letter, please call Mr. Abdool Jabar of the Hazardous Waste Compliance Section, at (212) 637-4131.

Sincerely yours,

George C. Meyer,P.E., Chief
RCRA Compliance Branch

cc: Jeanna R. Henry, Environmental Scientist
RCRA Compliance and Enforcement Branch, 3WC31
USEPA-Region 3
1650 Arch Street
Philadelphia, PA 19103

Enclosures

bcc: Abdool Jabar, DECA-RCB
George Meyer, DECA-RCB
RCRA file room

ATTACHMENT I

A RCRA Compliance Evaluation Inspection of Elan Chemical, Inc. was conducted on April 4 & 11, 2006 by an EPA authorized representative. During this inspection and follow-up investigation, it was discovered that Elan Chemical (NJD042895680) had been shipping its waste to Giant Resource Recovery facility. As a follow up to these investigative activities, the following information is requested:

For the period of June 2001 to June 2006, please provide 1) copies of all manifests/records of shipments of waste from Elan Chemical to Giant Resource Recovery; 2) waste profile documentation of each shipment from Elan Chemical to Giant Resource Recovery; 3) laboratory data or waste analyses that you may have on waste shipments accepted from Elan Chemical; and 4) land ban notifications provided to you by Elan Chemical.

ATTACHMENT II

INSTRUCTIONS

In responding to this Request for Information, apply the following instructions and definitions:

1. The signatory should be an officer or agent who is authorized to respond on behalf of the company or facility. The signatory must complete and return the attached Certification of Answers to Responses to Request for Information.

2. A complete response must be made to each individual question in this request for information. Identify each answer with the number of the question to which it is addressed.

3. In preparing your response to each question, consult with all present and former employees and agents of the company or facility who you have reason to believe may be familiar with the matter to which the question pertains.

4. In answering each question, identify all contributing sources of information.

5. If you are unable to answer a question in a detailed and complete manner or if you are unable to provide any of the information or documents requested, indicate the reason for your inability to do so. If you have reason to believe that there is an individual who may be able to provide more detail or documentation in response to any question, state that person's name and last known address and phone number and the reasons for your belief.

6. If you cannot provide a precise answer to any question, please approximate and state the reason for your inability to be specific.

7. For each document produced in response to this Request for Information, indicate on the document or in some other reasonable manner, the number of the question to which it applies.

8. If anything is deleted from a document produced in response to this Request for Information, state the reason for and the subject matter of the deletion.

9. If a document is requested but is not available, state the reason for its unavailability. In addition, identify any such document by author, date, subject matter, number of pages, and all recipients and their addresses.

10. The company and/or facility for the purposes of this Request for Information is Giant Resource Recovery.

11. A generator of hazardous waste for the purposes of this Request for Information shall be defined as any person (which includes this facility), by site, whose act or process produces a hazardous waste or whose act first causes a hazardous waste to become subject to the regulation.

12. Solid waste shall be defined for the purposes of this Request for Information as that term is defined in Section 1004(27) of RCRA, as amended, 42 U.S.C. Part 6903(27).

13. Hazardous waste shall be defined for the purposes of this Request for Information as that term is defined in Section 1004(5) of RCRA, as amended, 42 U.S.C. Part 6903(5).

14. Manage shall be defined for the purposes of this Request for Information as to market, generate, treat, store, dispose or otherwise handle.

CERTIFICATION OF ANSWERS TO REQUEST FOR INFORMATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document (response to EPA Request for Information) and all documents submitted herewith, that the submitted information is true, accurate and complete, and that all documents submitted herewith are complete and authentic, unless otherwise indicated. I am aware that there are significant penalties for submitting false information.

_____

NAME (print or type)

_____

TITLE (print or type)

_____

SIGNATURE

_____

DATE

Lee Spielmann/R2/USEPA/US
05/02/2007 03:22 PM

To Abdool Jabar/R2/USEPA/US@EPA, Sam Kerns/R2/USEPA/US@EPA, Joel Golumbek/R2/USEPA/US@EPA, Mary
cc
bcc
Subject Fw: Materials for Tomorrow's Meeting

----- Forwarded by Lee Spielmann/R2/USEPA/US on 05/02/2007 03:21 PM -----

scooke@mwe.com
05/02/2007 03:04 PM

To "Hankey, Rachel \(ENRD\)" <Rachel.Hankey@usdoj.gov>, Lee Spielmann/R2/USEPA/US@EPA
cc "'Neil Mulvey'" <npmulvey@optonline.net>, "Jocelyn Kapp Manship " <jocelyn@elan-chemical.com>
Subject Materials for Tomorrow's Meeting

********** PRIVILEGED AND CONFIDENTIAL **********

Rachel and Lee - I thought it would be helpful for our meeting tomorrow if I sent you in advance a copy of a diagram depicting the flow of material into and out of Tanks 77 and 78. Those are the onsite tanks that were the focus of USEPA's NOV issued on 4/28/06 to Elan Chemical. As you can see from the diagram, hazardous waste is first generated after the contents of Tank 77 has been pumped out and the aqueous portion of such material is separated out for wastewater treatment and eventual discharge to the POTW. I have also enclosed a summary of Elan Chemical's response to each of the claims set forth in the 4/28/06 NOV.

We look forward to seeing you at 10 AM on May 3rd. Please let me know if there is any particular floor to which we should go.

Susan M. Cooke, P.C.
McDermott Will & Emery LLP
28 State Street
Boston, MA 02109-1775
telephone: 617-535-4012
fax: 617-535-3800
e-mail: scooke@mwe.com

Susan M. Cooke, P.C.
McDermott Will & Emery LLP
28 State Street
Boston, MA 02109-1775
telephone: 617-535-4012
fax: 617-535-3800
e-mail: scooke@mwe.com


ElanBFD1.png


SDOC8311.pdf

Notes on Elan

1) storage without a permit or failing to comply with requirements which would exempt from permit
    a. namely labeling drums, making arrangements with local authorities, transmitting contingency plan, and BB and CC
        i. Only evidence asked them "are you complying with subparts BB and CC, said no"- also parts 2-6.
        ii. Only need one= did not label drums used to transfer between tanks
        iii. Making arrangements and transmitting says:- has it been enforced like here where there was notice to one agency. Need evidence that epa interprets to apply to all.

(a) The owner or operator must attempt to make the following arrangements, ***as appropriate*** for the type of waste handled at his facility and the potential need for the services of these organizations:

(1) Arrangements to familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of hazardous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to roads inside the facility, and possible evacuation routes;

(2) Where more than one police and fire department might respond to an emergency, agreements designating primary emergency authority to a specific police and a specific fire department, and agreements with any others to provide support to the primary emergency authority;

(3) Agreements with State emergency response teams, emergency response contractors, and equipment suppliers; and

(4) Arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility.

(b) Where State or local authorities decline to enter into such arrangements, the owner or operator must document the refusal in the operating record.

iv. Transmittal of contingency plans- says to all!

§ 265.53 Copies of contingency plan.

A copy of the contingency plan and all revisions to the plan must be:

(a) Maintained at the facility; and

(b) **Submitted to all** local police departments, fire departments, hospitals, and State and local emergency response teams that may be called upon to provide emergency services.

ARE THESE INDEPENDENT VIOLATIONS OR DO THE VIOLATIONS ONLY MEAN THEY NEEDED TO GET A PERMIT

2) failure to conduct monthly monitoring of pumps and leaks by the methods prescribed by the regulations- reference method 21- can't find- what does it require.
    a. Élan says that it performs daily inspections- why does this not meet requirement. There response to me says that they are conducting inspections on T-77 but that it was inadvertently omitted from paperwork. But the east tank farm includes 77 and 78.
    b. Only counting 2 and 3 as one violation anyway so no penalty really being assessed???
    c. How did you assess time period for penalty??- not true because used number to multiply??
3) failure to conduct monthly monitoring of valves by the methods prescribed by the regulations
    a. seems to admit
4) failure to conduct annual inspections of air emission control equipment- seems to apply regardless of whether you have a permit or not- so separate violation
    a. élan says that they did show epa inspection reports but there was a difference of opinion as to their adequacy. Why are they not adequate. Why is this not in the inspection report. Are there specific requirements for documentation?
    b. Inspection says "are you complying with bb and cc" is that the only question asked or was there a specific question- do you have documentation of annual inspections. Later says did not do annual inspection.
5) failure to conduct weekly inspection of pumps for leaks
    a. why are the daily inspections not sufficient to comply
    b. why use moderate and not minor when daily inspections being done.

6) failure to comply with recordkeeping regarding each piece of equipment 40 cfr 265.1050-.64 applies
7) failure to make a determination whether solid waste was generated

The tank 77 confusion- how will that affect violations- just more of the same kind? Just because not enough evidence now does not mean it should not be in consent decree or part of negotiations better to solve problem now.

EPCRA- seems really high

SUMMARY OF ALLEGED VIOLATIONS FROM 4/28/06 USEPA NOV & ELAN CHEMICAL RESPONSE

Claim No.	Summary of Alleged Violation	Elan Chemical Response and Information
1	40 CFR § 265.1064(g) Failure to identify and document in operating log each piece of equipment subject to 40 CFR Part 265 Subpart BB.	A list documenting each piece of equipment subject to 40 CFR Part 265 Subpart BB was submitted to USEPA on 7/19/06. This list was modified based on a determination that some entries on list were exempted from regulation pursuant to §265.1050(e). The modified list (consisting of 4 valves on Tank 78) and the applicable exemptions were submitted to USEPA on 9/18/06.
2	40 CFR § 265.1057 Failure to perform monthly monitoring, pursuant to 40 CFR § 265.1063(b), of valves that are in light liquid hazardous waste service.	A written document entitled "Monthly Monitoring Procedures" which sets forth the procedures for performing monthly monitoring of valves and pump identified as being in light liquid hazardous waste service, as well as a "Monthly Monitoring Log" to document monthly monitoring, were submitted to USEPA on 7/19/06. Prior to that time and continuing to the present time, the valves in question have been visually inspected on a daily basis.
3	40 CFR § 265.1052 Failure to perform weekly visual inspection and monthly monitoring, pursuant to 40 CFR § 265.1063(b), of pumps that are in light liquid hazardous waste service.	At the time of the USEPA inspection, Elan Chemical was performing, and continues to perform, daily visual inspections of Tank 78 and of pump between separating flask and Tank 78, including inspection of piping and valves for leaks. Records of daily visual inspections conducted during 2005 and 2006 were submitted to USEPA on 7/19/06. See also response to Claim #2 regarding monthly monitoring of pump in light liquid hazardous waste service. Note: Since the USEPA inspection, Elan Chemical has developed new inspection checklist for Tank 78 daily inspections which explicitly identifies the pumps. Inspections records for period 4/6/06 – 7/14/06 were submitted to USEPA on 7/19/06.

4	40 CFR § 264.1056(a)(1) Failure to cap/seal three open-ended valves/lines used to transport hazardous waste having organic content of 10% or more.	The three valves/lines identified by the USEPA inspector were immediately capped, removed, or replaced as noted in the 7/19/06 submission to USEPA. However, one of them (used for discharge to tanker trucks) was equipped with a second valve and thus was already in compliance with the regulation.
5	40 CFR § 265.1085(c)(4)(ii) Failure to perform annual inspections during 2003, 2004, and 2005 for Tank 78 which was storing organic hazardous waste with VOC content above 500 PPM.	The required initial and annual visual inspections of Tank 78 have been and continue to be performed. In fact, Elan Chemical performs monthly visual inspections of Tank 78. On 7/19/06, Elan Chemical submitted records of monthly visual inspections of Tank 78 for 2003, 2004, 2005, and 2006. Note: Elan Chemical has developed a separate checklist to document the annual visual inspection of Tank 78.
6	40 CFR § 262.34(a)(3) Failure to label three small containers as "hazardous waste".	The three containers were located in one of Elan Chemical's laboratories. As directed by USEPA, the containers were immediately labeled as "hazardous waste". USEPA was informed of this action in writing on 7/19/06.
7	40 CFR § 262.34(c)(1) Failure to close three containers of hazardous waste in satellite accumulation area as required by 40 CFR § 265.173(a).	The three containers were located in one of Elan Chemical's laboratories and inside a structure that provided secondary containment. Funnels were located on top of each container to facilitate the discharge of materials into them. As directed by USEPA, the containers were immediately closed with lids or other covers. USEPA was informed of this action in writing on 7/19/06.
8	40 CFR § 265.16(a) Failure to maintain documentation of job title/name of, and type/amount of training for, each employee with hazardous waste management responsibilities.	Elan Chemical was meeting, and continues to meet, this requirement. The documentation was provided to USEPA during the inspection. That documentation identified Lavaud Therlonge, the employee with designated responsibility for handling hazardous waste, whose job title is "Waste Handler/Mechanical Helper". This employee is responsible for hazardous waste inflow to and outflow from Tank 78. Since hazardous waste transfers are made on a batch-basis, such responsibility can be performed by a single employee. The documentation provided during the inspection also covered the 40-Hour Hazardous Waste Site Worker Training course and other safety training. In addition, Mr. Therlonge receives on-going refresher training. Documentation of training was also provided to the USEPA on 7/19/06.

9	40 CFR § 265.37 Failure to attempt to make arrangements, as appropriate for the type of waste and potential need for services, to familiarize local police and fire departments and local hospitals regarding the properties of hazardous waste handled at facility and types of injuries or illnesses which could result from fires, explosions, or releases at facility.	Elan Chemical was meeting, and continues to meet, this requirement. In addition to submitting its contingency plan every 5 years to the Newark Fire Dept. in order to obtain a required permit from that department, Elan Chemical has on display its hazardous materials permit issued by the Fire Dept. Documentation setting forth this information was available for review during the USEPA inspection and was also submitted to the USEPA on 7/19/06. Note: The only potentially applicable hazardous waste characteristic for waste handled at Elan Chemical is ignitability, and that only relates to the contents of Tank 78. The only hazards/properties of such waste are fire and/or explosion related to a spill or release. The City of Newark Fire Department is the primary response organization for any fire that should occur. Elan Chemical's files contain a letter dated November 14, 2005 from that the City of Newark Fire Department confirming that it will respond to any and all fire related emergencies or hazardous material incidents at Elan Chemical's Newark facility. Elan Chemical also has a Hazardous Materials Facility Permit issued by the City of Newark Fire Department on April 6, 2005. A fire inspector from the Fire Department conducts annual visits to the Newark site for inspection of the fire suppression systems. In addition to the written agreement with the City of Newark Fire Department, Elan Chemical has written agreements with two outside professional emergency response organizations. Those organizations are HMHTTC and S&D Environmental Services. Furthermore, for a number of years Elan Chemical has had an arrangement with a local clinic to provide medical services to its personnel who arrive at the clinic with MSDS information where appropriate.

10	40 CFR § 265.52(c) Failure to include, in facility contingency plan, description of arrangements agreed to by local police departments, fire departments, hospitals, contractors, and State and emergency responders for coordinating emergency services pursuant to § 265.37.	Elan Chemical was meeting, and continues to meet, this requirement. See response to Claim #9 above for further information. In addition, local hospitals are identified in documentation included with the contingency plan. Documentation was available for review during the USEPA inspection and was also submitted to the USEPA on 7/19/06.
11	40 CFR § 265.52(e) Failure to include, in facility contingency plan, up-to-date list of all emergency equipment at facility, with location, physical description, and capability of each listed item being identified.	Elan Chemical was meeting, and continues to meet this requirement. Documentation confirming compliance with this requirement was provided during the USEPA inspection. Documentation was also provided to the USEPA on 7/19/06. Elan Chemical's Discharge Prevention, Containment, and Countermeasures (DPCC) Plan includes a list of emergency equipment. Elan Chemical also had a written *Contingency and Emergency Plan* which contains a list of the emergency equipment. The list includes a description of the equipment, the quantity of equipment, and the location of such equipment. The facility also maintains a list of fire extinguishers and their location. The lists are reviewed and updated as necessary in accordance with state regulations.
12	40 CFR § 265.52(f) Failure to include evacuation plan in facility contingency plan that describes signal(s) used to begin evacuation and routes and alternate routes to be used.	Elan Chemical was meeting, and continues to meet, this requirement. Documentation confirming compliance was provided during the USEPA inspection. Documentation was also provided to the USEPA on 7/19/06. Note: Elan Chemical's DPCC Plan includes evacuation procedures. Elan Chemical's *Contingency and Emergency Plan* also contains a written evacuation plan. The evacuation plan has always been available and is reviewed and updated as necessary.

13	40 CFR § 265.53(b) Failure to submit copy of facility contingency plan to all local police departments, fire departments, hospitals, and State and local emergency responders that may be called upon to provide emergency services.	The City of Newark Fire Department has received a copy of the facility's contingency plan for at least the last 15 years at a frequency no less than every 5 years. In addition, the Fire Department hand Elan Chemical have a written agreement stating that the Fire Department will respond to any and all fire related emergencies or hazardous material incidents at Elan Chemical. To further document this written agreement, a copy of the facility's *Contingency and Emergency Plan* was submitted to the Newark Fire Department on 7/17/06. A copy of the transmittal letter was submitted to the USEPA on 7/19/06.
14	40 CFR § 262.1 Failure to make hazardous waste determination regarding (a) "abandoned chemicals" in two rooms adjacent to R&D Lab and (b) spent fluorescent tubes discarded in regular trash.	(a) The chemicals stored in the two rooms adjacent to the R&D Lab were not "abandoned". Instead, they were purchased by Elan Chemical and stored for use in R&D activities. At the time of the USEPA site visit in April 2006, all of these chemicals were intended for such use, and none of them were being held for disposal. Consequently, they were not waste, and therefore could not constitute hazardous waste. (b) Elan Chemical's supplier originally informed Elan that all fluorescent tubes purchased at the facility were 'green-tipped' tubes. 'Green-tipped' tubes are configured to always pass the TCLP test for metals, and thus would not constitute hazardous waste or universal waste. After the USEPA inspection, Elan Chemical conducted a thorough review of its files and determined that there were an estimated 132 tubes purchased during the period 2002 – 2006 which were not green-tipped. However, it is not known whether any of these bulbs would have failed the TCLP test. Elan Chemical has revised its purchasing practices to ensure that only green-tipped tubes can be purchased in the future. USEPA was informed of Elan Chemical's investigation and the results of the investigation on 7/19/06 and 8/2/06.

15	40 CFR § 195(a) Failure to conduct daily inspections of hazardous waste tank's overfill/spill control equipment, aboveground portions and immediately surrounding area, and monitoring/leak detection equipment for signs of corrosion and leaks.	Elan Chemical was meeting, and continues to meet, this requirement. Elan Chemical performs daily visual inspections of Tank 78, including inspection of piping and valves for leaks. It has records of these daily inspections dating back to 2002, and submitted documentation of the daily tank inspections for 2005 and 2006 (thru 5/5/06) to the USEPA on 7/19/06. Note: Elan Chemical has prepared and implemented an updated Inspection Checklist for daily visual inspections of Tank 78. A copy of this revised checklist was submitted to the USEPA on 7/19/06.
16	40 CFR § 195(c) Failure to document, in operating records, daily inspections of hazardous waste tank .	Elan Chemical was meeting, and continues to meet, this requirement. Elan Chemical has records of daily inspections of the hazardous waste tank dating back to 2002. Elan Chemical submitted documentation of the daily tank inspections for 2005 and 2006 (thru 5/5/06) to the USEPA on 7/19/06.

ELAN CHEMICAL COMPANY, INC.
Newark, NJ

SUMMARY RESULTS OF RCRA WASTE ANALYSES
DATE: April 23, 2007

COMPOUND SB (Residue of Product)	SAMPLE REF./NO.	IGNITABILITY (Flash Point; deg.F)	CORROSIVITY (pH)	REACTIVITY	TOXICITY (TCLP)	COMMENTS
EMPG-aldehyde C-16	67461	> 212	9.2	No	No	Test results submitted to USEPA on 7/19/06
Natural roasted cassia oil (natural benzaldehyde)	182000	> 180	9.4	No	No	Test results submitted to USEPA on 7/19/06
1,2,hexanediol	182001	> 180	7.65	No	No	Test results submitted to USEPA on 7/19/06
Ethyl cinnamate	182002	> 180		No	No	Test results submitted to USEPA on 7/19/06
Butyl butyryl lactate	184779	> 180	4.37	No	No	Test results submitted on 11/1/06
Acetyl propionyl	184780	> 180	4.29	No	No	Test results submitted on 11/1/06
Ethyl caprate	184781	> 140	12.13	No	No	Test results submitted on 11/1/06
Diethyl Sebacate	184782	> 180	11.94	No	No	Test results submitted on 11/1/06
Ethyl benzoate	184783	> 180	11.19	No	No	Test results submitted on 11/1/06

Anisyl alcohol	184784	> 140	8.98	No	No	Test results submitted on 11/1/06
Ethyl decanoate	184785	> 140	7.08	No	No	Test results submitted on 11/1/06
PEEB	188439	> 140	8.45	No	No	Test results submitted on 4/23/07
Aldehyde C-18	188440	> 140	8.18	No	No	Test results submitted on 4/23/07

SUMMARY OF ALLEGED VIOLATIONS FROM 4/28/06 USEPA NOV & ELAN CHEMICAL RESPONSE

Claim No.	Summary of Alleged Violation	Elan Chemical Response and Information
1	40 CFR § 265.1064(g) Failure to identify and document in operating log each piece of equipment subject to 40 CFR Part 265 Subpart BB.	A list documenting each piece of equipment subject to 40 CFR Part 265 Subpart BB was submitted to USEPA on 7/19/06. This list was modified based on a determination that some entries on list were exempted from regulation pursuant to §265.1050(e). The modified list (consisting of 4 valves on Tank 78) and the applicable exemptions were submitted to USEPA on 9/18/06.
2	40 CFR § 265.1057 Failure to perform monthly monitoring, pursuant to 40 CFR § 265.1063(b), of valves that are in light liquid hazardous waste service.	A written document entitled "Monthly Monitoring Procedures" which sets forth the procedures for performing monthly monitoring of valves and pump identified as being in light liquid hazardous waste service, as well as a "Monthly Monitoring Log" to document monthly monitoring, were submitted to USEPA on 7/19/06. Prior to that time and continuing to the present time, the valves in question have been visually inspected on a daily basis.
3	40 CFR § 265.1052 Failure to perform weekly visual inspection and monthly monitoring, pursuant to 40 CFR § 265.1063(b), of pumps that are in light liquid hazardous waste service.	At the time of the USEPA inspection, Elan Chemical was performing, and continues to perform, daily visual inspections of Tank 78 and of pump between separating flask and Tank 78, including inspection of piping and valves for leaks. Records of daily visual inspections conducted during 2005 and 2006 were submitted to USEPA on 7/19/06. See also response to Claim #2 regarding monthly monitoring of pump in light liquid hazardous waste service. Note: Since the USEPA inspection, Elan Chemical has developed new inspection checklist for Tank 78 daily inspections which explicitly identifies the pumps. Inspections records for period 4/6/06 – 7/14/06 were submitted to USEPA on 7/19/06.

4	40 CFR § 264.1056(a)(1) Failure to cap/seal three open-ended valves/lines used to transport hazardous waste having organic content of 10% or more.	The three valves/lines identified by the USEPA inspector were immediately capped, removed, or replaced as noted in the 7/19/06 submission to USEPA. However, one of them (used for discharge to tanker trucks) was equipped with a second valve and thus was already in compliance with the regulation.
5	40 CFR § 265.1085(c)(4)(ii) Failure to perform annual inspections during 2003, 2004, and 2005 for Tank 78 which was storing organic hazardous waste with VOC content above 500 PPM.	The required initial and annual visual inspections of Tank 78 have been and continue to be performed. In fact, Elan Chemical performs monthly visual inspections of Tank 78. On 7/19/06, Elan Chemical submitted records of monthly visual inspections of Tank 78 for 2003, 2004, 2005, and 2006. Note: Elan Chemical has developed a separate checklist to document the annual visual inspection of Tank 78.
6	40 CFR § 262.34(a)(3) Failure to label three small containers as "hazardous waste".	The three containers were located in one of Elan Chemical's laboratories. As directed by USEPA, the containers were immediately labeled as "hazardous waste". USEPA was informed of this action in writing on 7/19/06.
7	40 CFR § 262.34(c)(1) Failure to close three containers of hazardous waste in satellite accumulation area as required by 40 CFR § 265.173(a).	The three containers were located in one of Elan Chemical's laboratories and inside a structure that provided secondary containment. Funnels were located on top of each container to facilitate the discharge of materials into them. As directed by USEPA, the containers were immediately closed with lids or other covers. USEPA was informed of this action in writing on 7/19/06.
8	40 CFR § 265.16(a) Failure to maintain documentation of job title/name of, and type/amount of training for, each employee with hazardous waste management responsibilities.	Elan Chemical was meeting, and continues to meet, this requirement. The documentation was provided to USEPA during the inspection. That documentation identified Lavaud Therlonge, the employee with designated responsibility for handling hazardous waste, whose job title is "Waste Handler/Mechanical Helper". This employee is responsible for hazardous waste inflow to and outflow from Tank 78. Since hazardous waste transfers are made on a batch-basis, such responsibility can be performed by a single employee. The documentation provided during the inspection also covered the 40-Hour Hazardous Waste Site Worker Training course and other safety training. In addition, Mr. Therlonge receives on-going refresher training. Documentation of training was also provided to the USEPA on 7/19/06.

9	40 CFR § 265.37 Failure to attempt to make arrangements, as appropriate for the type of waste and potential need for services, to familiarize local police and fire departments and local hospitals regarding the properties of hazardous waste handled at facility and types of injuries or illnesses which could result from fires, explosions, or releases at facility.	Elan Chemical was meeting, and continues to meet, this requirement. In addition to submitting its contingency plan every 5 years to the Newark Fire Dept. in order to obtain a required permit from that department, Elan Chemical has on display its hazardous materials permit issued by the Fire Dept. Documentation setting forth this information was available for review during the USEPA inspection and was also submitted to the USEPA on 7/19/06. Note: The only potentially applicable hazardous waste characteristic for waste handled at Elan Chemical is ignitability, and that only relates to the contents of Tank 78. The only hazards/properties of such waste are fire and/or explosion related to a spill or release. The City of Newark Fire Department is the primary response organization for any fire that should occur. Elan Chemical's files contain a letter dated November 14, 2005 from that the City of Newark Fire Department confirming that it will respond to any and all fire related emergencies or hazardous material incidents at Elan Chemical's Newark facility. Elan Chemical also has a Hazardous Materials Facility Permit issued by the City of Newark Fire Department on April 6, 2005. A fire inspector from the Fire Department conducts annual visits to the Newark site for inspection of the fire suppression systems. In addition to the written agreement with the City of Newark Fire Department, Elan Chemical has written agreements with two outside professional emergency response organizations. Those organizations are HMHTTC and S&D Environmental Services. Furthermore, for a number of years Elan Chemical has had an arrangement with a local clinic to provide medical services to its personnel who arrive at the clinic with MSDS information where appropriate.

10	40 CFR § 265.52(c) Failure to include, in facility contingency plan, description of arrangements agreed to by local police departments, fire departments, hospitals, contractors, and State and emergency responders for coordinating emergency services pursuant to § 265.37.	Elan Chemical was meeting, and continues to meet, this requirement. See response to Claim #9 above for further information. In addition, local hospitals are identified in documentation included with the contingency plan. Documentation was available for review during the USEPA inspection and was also submitted to the USEPA on 7/19/06.
11	40 CFR § 265.52(e) Failure to include, in facility contingency plan, up-to-date list of all emergency equipment at facility, with location, physical description, and capability of each listed item being identified.	Elan Chemical was meeting, and continues to meet this requirement. Documentation confirming compliance with this requirement was provided during the USEPA inspection. Documentation was also provided to the USEPA on 7/19/06. Elan Chemical's Discharge Prevention, Containment, and Countermeasures (DPCC) Plan includes a list of emergency equipment. Elan Chemical also had a written *Contingency and Emergency Plan* which contains a list of the emergency equipment. The list includes a description of the equipment, the quantity of equipment, and the location of such equipment. The facility also maintains a list of fire extinguishers and their location. The lists are reviewed and updated as necessary in accordance with state regulations.
12	40 CFR § 265.52(f) Failure to include evacuation plan in facility contingency plan that describes signal(s) used to begin evacuation and routes and alternate routes to be used.	Elan Chemical was meeting, and continues to meet, this requirement. Documentation confirming compliance was provided during the USEPA inspection. Documentation was also provided to the USEPA on 7/19/06. Note: Elan Chemical's DPCC Plan includes evacuation procedures. Elan Chemical's *Contingency and Emergency Plan* also contains a written evacuation plan. The evacuation plan has always been available and is reviewed and updated as necessary.

13	40 CFR § 265.53(b) Failure to submit copy of facility contingency plan to all local police departments, fire departments, hospitals, and State and local emergency responders that may be called upon to provide emergency services.	The City of Newark Fire Department has received a copy of the facility's contingency plan for at least the last 15 years at a frequency no less than every 5 years. In addition, the Fire Department hand Elan Chemical have a written agreement stating that the Fire Department will respond to any and all fire related emergencies or hazardous material incidents at Elan Chemical. To further document this written agreement, a copy of the facility's *Contingency and Emergency Plan* was submitted to the Newark Fire Department on 7/17/06. A copy of the transmittal letter was submitted to the USEPA on 7/19/06.
14	40 CFR § 262.11 Failure to make hazardous waste determination regarding (a) "abandoned chemicals" in two rooms adjacent to R&D Lab and (b) spent fluorescent tubes discarded in regular trash.	(a) The chemicals stored in the two rooms adjacent to the R&D Lab were not "abandoned". Instead, they were purchased by Elan Chemical and stored for use in R&D activities. At the time of the USEPA site visit in April 2006, all of these chemicals were intended for such use, and none of them were being held for disposal. Consequently, they were not waste, and therefore could not constitute hazardous waste. (b) Elan Chemical's supplier originally informed Elan that all fluorescent tubes purchased at the facility were 'green-tipped' tubes. 'Green-tipped' tubes are configured to always pass the TCLP test for metals, and thus would not constitute hazardous waste or universal waste. After the USEPA inspection, Elan Chemical conducted a thorough review of its files and determined that there were an estimated 132 tubes purchased during the period 2002 – 2006 which were not green-tipped. However, it is not known whether any of these bulbs would have failed the TCLP test. Elan Chemical has revised its purchasing practices to ensure that only green-tipped tubes can be purchased in the future. USEPA was informed of Elan Chemical's investigation and the results of the investigation on 7/19/06 and 8/2/06.

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